
T R E A T I S E
ON THE
CULTURE OF THE VINE.

T R E A T I S E

2



CULTURE OF VINE

A
T R E A T I S E
O N T H E
C U L T U R E O F T H E V I N E,
EXHIBITING NEW AND ADVANTAGEOUS
METHODS OF
PROPAGATING, CULTIVATING,
AND TRAINING
T H A T
P L A N T,
SO AS TO RENDER IT ABUNDANTLY FRUITFUL.
TOGETHER WITH
NEW HINTS ON THE FORMATION
O F
V I N E Y A R D S I N E N G L A N D.

By WILLIAM SPEECHLY,
GARDENER to the DUKE of PORTLAND.

D U B L I N:

PRINTED FOR P. WOGAN, P. BYRNE, J. MOORE,
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M, DCC. XCI.

T H E A T T E S T

OF THE

CULTURE OF THE VINE



AND TRAINING

IN

F A I A N T

TO BE HAD OF THE SOCIETY'S TRUSTEES

AT THE SOCIETY'S OFFICE

NEW YORKS ON THE 15TH

OF

VINEYARDS IN ENGLAND

THE SOCIETY'S OFFICE
ORIGINAL OF THE SOCIETY'S

D U B L I N

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DEDICATION.

TO

HIS GRACE the DUKE of PORTLAND,

&c. &c. &c.

MY LORD,

I Have the greatest satisfaction in the honour of being permitted to give the Public this Treatise on the Culture of the Vine under your Grace's patronage, as it affords me an opportunity of acknowledging the very great assistance I have constantly received from your Grace in the progress of this work.

The

vi DEDICATION.

The various modes of cultivating the Vine, and bringing its fruit to the highest degree of perfection that this climate will admit of, has long been one of the first objects of my attention ; and I with gratitude repeat my obligations to your Grace, for the support and encouragement you have given the endeavours I have exerted in the pursuit of this study.

As this work is the result of many years application and actual experience, and contains, as I believe, much new and original matter, I am willing to flatter myself that it will prove neither useless nor unacceptable to my readers.

The success of my endeavours is the best plea for my presuming to submit this performance to their perusal ;

DEDICATION. vii

rusal: And as I have had the good fortune to receive your Grace's approbation in almost every stage of this undertaking, I venture to communicate it to the Public with a degree of confidence which nothing but so distinguished a sanction could induce me to entertain.

I have the honour to be,

My Lord,

Your Grace's most obedient,

And most dutiful servant,

W. SPEECHLY.

DEDICATION

And as I have had the good
fortune to receive your Grace's as-
surance in almost every stage of the
undertaking, I venture to recom-
mend it to the public with a great
confidence with nothing but to be
imparted a portion could induce me
to entertain.

I have the honour to be

My Lord

Your Grace's most obedient

And most dutiful servant

W. STEPHENSON

P R E F A C E.

THERE never was a period when the science of gardening was so universally and so ardently cultivated as it is at present ; and of the extensive field of Horticulture, no part affords more agreeable amusement, or yields more solid satisfaction and advantage, than that refined and elegant branch of it, which concerns the forcing of fruits, natives of warmer climes ; and among these, though the variety of them be so great, the Vine stands foremost and the most conspicuous.

Of all the numerous sorts of fruits, indulgent nature produces for the use of man, that of the grape must be esteemed her

b

noblest

noblest gift ; for although various others not only afford comforts, but many of them even contribute to the luxury of the human race, yet none of them tend so eminently as does this fruit, “ to glad the heart.”—Hail then, precious Vine ! let me modestly presume to treat of thy culture, and to set forth thy virtues, a theme worthy of the immortal gods ! O, may thy superior excellences everlastingly inspire man with duty, and with unfeigned gratitude to the 'all-bounteous Giver.

In the most early ages the Vine became an object of attention and improvement ; for we find it the first-cultivated plant on record in holy writ, *Gen. ix. 20.* And if we duly consider the vast importance of its fruit in every shape and view, it may justly be esteemed the best and most useful fruit-tree in the world. The ripe fruit serves to constitute a rich and wholesome repast ; and when dried, forms a most material and lucrative article of commerce to the inhabitants of many parts of the globe : But the most important and most transcendent article, wine, may justly be esteemed as one of our choicest blessings,

blessings, so the most valuable gift of nature.

From the situation of this island, and from the nature of the Vine, it may seem doubtful whether wine can be made in this country to any considerable national advantage : But still we find, by experience, that by artificial means, even the latest kinds of grapes may be brought to almost as high a degree of perfection as they are in their own native soils and climates. The principal objects of expence required for this end are *fuel* and *glass* ; the former article is of small consideration in counties where coals abound, but glass is become a truly serious affair ; and indeed it were much to be wished, that glass employed in gardens should be exempt from duty ; for please to consider, by the aid of this useful material in gardening, our markets would be more plentifully supplied with many kinds of fruit, and also with rare and wholesome vegetables, at a much earlier season than in the natural way they can possibly be ; and these, let me observe, are not to be considered as articles of luxury.

But in regard to the variety of plants, generally cultivated in stoves, &c. I may properly add, that, independently of profit, every denomination of Forcing-houses is capable of affording to a speculative mind, a source of rational pleasure and real satisfaction.

An attention to the progress of vegetable life administers to the mind something more solid than mere amusement.—The budding, leafing, and flowering of plants, together with the progress of the various fruits from their first infantile appearance, to the final period of their perfection, all unfold a scene of admiration and amazement, of gratitude and thankfulness.*

The

* “ There is a particular pleasure to see things in their
 “ origin, and by what degrees and successive changes
 “ they rise into that order and state we see them in
 “ afterwards, when compleated. I am sure, if ever
 “ we would view the paths of Divine Wisdom, in the
 “ works and in the conduct of nature, we must not
 “ only consider how things are, but how they came
 “ to be so.

“ It

The humble Hyssop on the wall, as well as the lofty Cedar, shows plainly that an Almighty and an all-wise hand has formed it. Nature's works are all complete, and the more minutely we observe, investigate, and consider them, the more we must admire the wisdom, and adore the goodness of the munificent and august Creator.*

To

“ It is pleasant to look upon a tree in the summer, covered with its green leaves, decked with blossoms, or laden with fruit, and casting a pleasing shade under its spreading boughs ; but to consider how this tree, with all its furniture, sprang from a little seed, how nature shaped it, and fed it in its infancy and growth ; added new parts, and still advanced it by little and little, till it came to this greatness and perfection : This, methinks, is another sort of pleasure, more rational, less common, and which is properly the contemplation of Divine Wisdom in the works of nature.”

Dr. Burnet's Theory of the Earth,
vol. i. book i. chap. v.

*Dr. R. Watson, in his *Chemical Essays*, vol. i. p. 86, has thus judiciously observed the surprising and beautiful regularity of nature.

“ There

To come now to the ensuing work. The first object of consideration is the Pine and Grape-stove ; and it must be admitted, that the original and principal object of an Hot-house consists in the culture of the Ananas or Pine-Apple ; but still, if the Pinery be properly constructed, Vines may, at the same time,

“ There are a great many circumstances relative to the
“ manner in which different salts crystallize, which
“ cannot be insisted on in this place ; one thing de-
“ serves particularly to be remarked, that every salt
“ in crystallizing, invariably assumes its own pecu-
“ liar form. You may dissolve common salt, or salt-
“ petre, a thousand times, and crystallize them as
“ often by evaporating or cooling the water in which
“ they are dissolved, yet will you still find the common
“ salt will be constantly crystallized in the form of a
“ cube, and the saltpetre in the form of a prism ; and
“ if you examine with a microscope such saline par-
“ ticles as are not visible to the naked eye, you will
“ observe these particles to be of the same shape with
“ the larger masses. The definite figure appropriate
“ to every particular species of salt, may admit a little
“ variety from the accidental admixture of other
“ bodies, or from some singular circumstances attend-
“ ing the evaporation and crystallization of the solu-
“ tion ; but these varieties are foreign to the nature of
“ the

time, be propagated therein to great advantage.

I know there are many persons who dissent from this mode of practice, and they found their opinions on the following objections :

FIRST, They suppose that Pine-stoves are improper for Vines, because the Pine being a tropical plant, it naturally requires a greater degree

“ the salt, and are not greater than what attend almost
 “ every species of vegetables, and even of animals,
 “ from change of food and climate.

“ Here a large field of inquiry opens to our view ;
 “ and though it be better, as Seneca has it, *de re*
 “ *ipsa querere quàm mirari* ; yet all our attempts to
 “ investigate the works of God are weak and inef-
 “ fectual ; we feel his interference every where, but
 “ we cannot apprehend the nature of his agency
 “ any where. A blade of grass cannot spring up,
 “ a drop of rain cannot fall, a ray of light cannot
 “ be emitted from the sun, nor a particle of salt be
 “ united, with a never-failing symmetry, to its fellow,
 “ without him : Every secondary cause we discover,
 “ is but a new proof of the necessity we are under of
 “ ultimately recurring to him, as the primary cause
 “ of every thing.”

degree of heat than the Vine can possibly bear.

SECONDLY, Because it is usual to train the Vines along the undersides of the rafters which support the glass-frames, they suppose that their leaves, by contributing to darken the stove, must, consequently, tend greatly to injure the crop of Pines.

THIRDLY, They alledge, and this is but too prevalent an opinion, that grapes produced in Pine-stoves are seldom so well flavoured as grapes from a Vinery.

To the first of these objections I here reply, by asserting that the Vine will bear the degree of heat proper for Pines, and that is proved by daily experience. There is a Vine now (1789) growing in the Pinery at Welbeck, which has constantly produced good crops of grapes for more than twenty years past. Its roots are intirely within the house, and make annual progress in the Pine-pits, among the leaves of trees, which are used here instead of tan; and please to consider, that in this mode of proceeding,

ceeding, the situations of the Pine and Vine are extremely different.

The Pine is situated in the lower part of the house, but the shoots of the Vine are trained immediately under the roof, and, consequently, are greatly affected by the external air, especially when such air is admitted into the house. Besides, let me add, that Pines, being plunged in the tan-bed, receive a constant warmth from thence, and their roots are nourished by their genial heat. But the whole system of the fibres in the roots of the Vines being in the open ground on the outside of the house, they are at all times exposed to the weather, which must necessarily have a wonderful effect upon the whole plant at all seasons of the year.

That the second objection is of force, where the Vines in a Hot-house are under an injudicious management, must be admitted; but when their shoots are trained with propriety, and according to the method herein prescribed, the Pines will rather be benefited than injured, by the kindly shade the Vine leaves will afford.

And

And as to the last objection, grapes, well perfected in Hot-houses, are generally very rich; but it must be confessed that their skins are very often impregnated with a disagreeable flavour: But I shall venture to affirm, that the cause of this defect most generally proceeds, either from the languishing state of the Vine, the effect of insects, or else from fumigations, or some similar practice, made use of to destroy the various insects that infest Hot-houses; and, therefore, I insist, first, that a plentiful admission of free air in summer is as necessary for the Pine as the Vine. See section on air, &c. p. 59, in my Treatise on the Culture of the Pine, &c.

And secondly, that when air is properly and plentifully admitted into the Hot-house, and every other part of the management is conducted with propriety, grapes produced in Pine-stoves commonly prove well flavoured, and in a high state of perfection.

The advantages to be gained by the new methods of propagating the Vine by

feed, and by engrafting, appear very conspicuous in Theory : And I have now the pleasure of informing my readers, that the event upon trial and practice has proved quite flattering and equally satisfactory.

My best endeavours, moreover, have not been wanting in obtaining new varieties of grapes from abroad : And I trust that many of the species here enumerated, will be considered as a real and valuable acquisition to this country.

It is possible that the mode of practice herein set forth may, in certain respects, be deemed by some as superfluous. They may alledge that good grapes may be gotten by methods less expensive. But let me tell them, that in order to obtain grapes in a supreme degree of perfection, in a country so situated as ours is, one ought to employ every expedient that may seem calculated to tend to advantage, and ensure success.

And in respect of erecting buildings, either Vineries, or Pine and Grape-stoves,

stoves, whatever may be the design intended, I most strongly advise, that such erections should be well and substantially executed.

I not originally intend to give an account of Vineyards in the following work, but considering that a treatise on the culture of the Vine would appear deficient without it, I resolved to add the fourth book, expressly for the purpose of illustrating that subject; and I am willing to hope, that on account of the original hints there given, it will not be deemed the least useful and important part of this treatise.

The Duke of Portland, after all his other indulgences, was pleased to give me free access to his Grace's noble library at this place, which has enabled me to add many important observations in the *notes*, which cannot fail of being acceptable to the *reader*. The names of the authors consulted will appear in the respective notes.

Here now, that I am drawing my preface to a conclusion, I must intreat the reader
to

to permit me to make my acknowledgments, that I may not appear ungrateful to some of my living friends.—My warmest thanks are due to my much-esteemed and truly-learned friend the Rev. Samuel Pegge, of Whittington, Derbyshire, for his excellent *note* on the large bunch of grapes produced at Welbeck in the year 1781, inserted in p. 56—also for his curious and important note in p. 253—and likewise for his further friendly assistance.

I feel myself under singular obligations to my worthy and learned friend the Rev. Mr. Michell, for his obliging communication of a new and eligible method of raising Vine-plants; and also for his important note on this subject, inserted page 71.

William Hanbury, Esq; has my warmest thanks for having obligingly favoured me with an account of the surprising progress of some Vines at Kelmarsh in Northamptonshire, during the course of last summer, as inserted in p. 102.

The

The Rev. Mr. Philip Laurents has laid me under an obligation, by favouring me with an elegant account of an extensive Vine now growing at St. Edmundsbury in Suffolk, page 243.

My kindest acknowledgments are due to my much esteemed, worthy, and truly ingenious friend Haman Rooke, Esq; for his elegant perspective to the plate of the section of a hill for the growth of Vines in England.

I am also particularly indebted to my much-honoured and learned friend, the Rev. Dr. Kaye, Dean of Lincoln, for the elegant drawing of an enormous Vine, now growing at Northallerton in Yorkshire, taken some years ago, when that surprising tree was in a flourishing state, by the correct and inimitable hand of Mr Grimm.

I wish to convey to Mr. Basire my acknowledgment of the accuracy and elegance of the engravings executed by him, and which make an useful and ornamental part of this work.

Lastly,

Lastly, my most grateful acknowledgments are due to my very excellent, worthy, and truly-learned friend Dr. A. Hunter. His obliging and assiduous attention to the work during the time it was in the press, has greatly contributed towards rendering it more worthy of the public approbation.

Welbeck, May 1, 1789.

THE FUTURE

It is a very great pleasure to me to see you so well, and to hear that you are so happy. I am sure that you will continue to be so, and that you will be able to do all the good that you wish to do. I am sure that you will be able to do all the good that you wish to do, and that you will be able to do all the good that you wish to do.

I am sure that you will be able to do all the good that you wish to do, and that you will be able to do all the good that you wish to do. I am sure that you will be able to do all the good that you wish to do, and that you will be able to do all the good that you wish to do. I am sure that you will be able to do all the good that you wish to do, and that you will be able to do all the good that you wish to do.

present in many particulars, but especially in the shape, colour, and flavour of the grapes.

CULTURE OF THE VINE, OR GRAPE-TREE.

I have, for a long series of years, exerted my utmost endeavours in obtaining different varieties of grapes from various parts of the globe; and I flatter myself, that many of the

THERE are several species of the Vine, but I shall only take notice of the principal sort, (*Vitis Vinifera*) which is so highly and justly esteemed for its most excellent and valuable fruit. Of this there are a

A numerous

ESSENTIAL CHARACTER.

^a VITIS VINE.

GENERIC CHARACTER.

- CALYX.** *Perianthium* five-toothed, small.
- COROLLA.** *Petals* five, simple, small, soon falling off.
- STAMINA.** *Filaments* five, awl-shaped, and somewhat spreading, falling off; *Antheræ* simple.
- PISTILLUM.** *Germen* egg-shaped; *Style* none; *Stigma* blunt-headed.
- PERICARPIUM.** *Berry* roundish, large, of one cell.

SEMINA.

OF THE CULTURE

numerous variety, which are exceedingly different in many particulars, but especially in the shape, colour, and flavour of the grapes.

As new kinds of grapes are constantly raised from seed, the Vine admits of an almost infinite variety, which are all supposed to be the progeny of one mother species.

I have, for a long series of years, exerted my utmost endeavours in obtaining different varieties of grapes from various parts of the globe; and I flatter myself, that many of the sorts will be deemed real acquisitions to this country. I shall not, however, enumerate all the varieties that compose the list of grapes now

SEMINA. Seeds five, boney, heart and somewhat top-shaped; contracted at the edge, nearly two-celled.

ESSENTIAL CHARACTER.

Petals cohering at the base, withering. *Berry* five-seeded.

SPECIFIC CHARACTER.

VITIS *Vinifera*. VINE wine-yielding.

V. *Leaves* lobed, sinuous, naked. *Tendrils* opposite to the leaves, bearing the fruit and flowers in clusters.

A native of the temperate climates in the four parts of the world.

The Vine, according to the Sexual System of Botany, belongs to the class and order *Pentandria Monogynia*, the flowers having five stamina and one style.

now growing at Welbeck, (which consists of above 100 sorts) as some of them have not yet borne fruit, and many others are esteemed only on account of being proper for making wine; some of the sorts, moreover, are so much alike, that no distinct difference of species is easily to be discovered. The following sorts, however, appear to be distinct species; and, among them, are grapes of the first and best quality. ||§||

I. WHITE MUSCAT OF ALEXANDRIA.

The berries of this species are large and oval; and, when perfectly ripe, are of a fine amber colour. The skins are thick, and the flesh, or pulp, hard, and not very juicy, but of a high musky flavour. The berries hang loosely, and compose long well-formed bunches.

This grape is in great estimation, and is, at present, more generally planted in Hot-houses than any other sort. *

A 2 21. BLACK

||§|| An Asterism (*) marks the proper sorts for a Hot-house.—A Dagger (†) for a Vinery.—A Double Dagger (‡) for a common Wall.

2. BLACK DAMASCUS.

The berries of this species are large, round, and of a fine black colour; the skin thin, and the flesh delicate, rich, juicy, and of an exquisite flavour.

The same bunch commonly consists of berries of different sizes; the small berries are without stones, and the large ones contain only one in each berry. This, although a late grape, is a most excellent and very valuable sort. *

3. BLACK GRAPE FROM TRIPOLI.

This grape seems nearly allied to the former species; but the bunches are always composed of large berries of an equal size, and with one stone in each. This circumstance of the berries being equal in size, renders the bunches of a more agreeable appearance. The foliage in both is exceedingly beautiful in the autumn, and very similar. This may be reckoned a truly valuable grape. *

4. ALEPPO

4. ALEPPO GRAPE. 1. 2.

MORCCO GRAPE

This is a middle-sized roundish grape, with a thin skin and delicate juicy flesh, of an exquisite vinous flavour. The colour is commonly very various. I have seen on the same bunch some berries quite white, others entirely black, but the major part are curiously striped with black and white. Sometimes a berry will be one half white and the other half black. But what appears most remarkable is, that the colours do not intermix, but are divided by straight lines, as if painted. The leaves of this sort are in the autumn very curiously striped, with red, green, and yellow, something similar to the Aleppo lettuce. *†

5. RED GRAPE FROM SYRACUSE.

This is a very large grape, of a red colour, and of an oval figure, somewhat irregularly formed. The berries hang rather loosely on the bunches, which are pretty large. This noble grape is but little known in this country. *

6. LE COEUR GRAPE, OR MOROCCO GRAPE.

This species produces large berries, in figure somewhat heart-shaped, and of a tawny grizzly colour. The bunches are often composed of unequally-sized berries, some of them being exceedingly large. These never contain more than one stone a piece, and the lesser-sized berries are always without stones. The foot-stalks of the berries are short, and singularly large, differing from most other sorts. This is a much esteemed grape, and is very scarce.*

7. GOLDEN GALICIAN. †

The berries of this species are large, and of an oval figure; the flesh hard, but of a tolerable flavour. These, together with the foot-stalks, are of a light yellow colour.*

8. BLACK

8. BLACK MUSCADEL.

Of this species the berries are large, oval, and of a black colour; the skin thin, with a delicate juicy flesh.

The same bunch contains berries of different sizes, some of them very large and long, but somewhat compressed and flat at the ends. The leaves of this grape change in autumn to a beautiful scarlet. *

9. RED MUSCADEL.

The berries of this sort are large, oval and of a beautiful red colour; the skin is thick and the flesh hard, something like the raisin grape. The bunches frequently arrive to six or seven pounds, and are most elegantly formed of berries of an equal size. This is one of the latest grapes. The leaves change in autumn to a beautiful red and green. *

10. WHITE

10. WHITE GRAPE FROM ALCOBACA.

This has a large oval white berry, with a thin skin and juicy flesh. The bunches are large and long, without shoulders.

This species, with many others, was sent me from Portugal by my much-esteemed friend, Gerrard de Visme, Esq.

11. WHITE FRONTINAC.

The berries of this species are round, of a moderate size, and of a greenish yellow, and compose long unshouldered bunches.

The berries of this species are somewhat larger than the former, are round, and their colour brown and red intermixed with yellow.

Both these sorts of grapes possess a high musky, perfumed flavour. *†

12. GRIZZLY FRONTINAC.

Both these sorts of grapes possess a high musky, perfumed flavour. *†

only seen two or three bunches of this
 grade produced here last year. It is a
 BLACK, OR PURPLE FRONTINAC. (which came from France the prece-
 dent year.) The berries of this species are black, but
 when produced under glass are generally of a
 dark purple colour, are moderately large,
 round, and of a most excellent flavour.
 They compose very long bunches. This has
 been hitherto generally called the Red Fron-
 tinac, and is one of the very best grapes.
 I had it from the Cape of *Good Hope* by the
 name of *Black Constantia*.

This is a very large round white grape.
 The berries are of a moderate size, and are replete with
 juice. It is called the BLUE, OR VIOLET FRONTINAC. This has a small black berry, powdered
 with a fine blue or violet bloom, and is of a
 more delicate flavour. The berries grow
 close upon the bunches, which are very small.
 This is commonly called the Black Frontinac,
 but the French name it *Musc de Violette*. It is
 pagged in the forcing-houses in Holland, in
 preference to any other sort. It is by the

15. RED FRONTINAC.

The berries of this fruit are of a moderate
 size. I must beg leave to observe, that I have
 only

only seen two or three bunches of this grape, produced here last summer, from a plant (which came from France the preceding year) growing in a pot about a foot diameter.

It is undoubtedly the *true Red Frontinac*, which has induced me to change the names of the two foregoing species.*†

16. WHITE SWEETWATER

This is a very large round white grape. The berries grow close on the bunch, which is of a moderate size, and are replete with an agreeable juice. The skin and flesh of this grape are more delicate than of any other sort. In some situations, the berries on the sides of the bunches, next the sun, are clouded with spots of a ruflet colour, and they are then generally most admirable. This grape is propagated in the forcing-houses in *Holland*, in preference to any other sort. It is by the Dutch called *Parel druys*.*†‡

17. BLACK

17. BLACK SWEETWATER.

The berries of this species are much smaller than the former, are black, grow in small short close bunches, and are replete with a very sweet juice. The skin being thin, and very subject to crack, it is an improper grape to be propagated in a Hot-house. †

18. BLACK HAMBURGH.

The berries of this species are large, inclining to an oval figure, and of a black colour. They hang loosely on the bunch, and compose well-formed handsome bunches.

The skin is thick and the pulp hard; but, notwithstanding these defects, it is a very valuable grape, being a good flavoured fruit and a plentiful bearer. †

19. RED HAMBURGH.

The berries of this sort are of a dark red, with thin skins and juicy delicate flesh. The size and figure of both the berry and bunch are

are nearly like the former. It is sometimes called the Gibraltar Grape. *†

The berries of this species are much smaller than the former, are black, grow in small
 20. WHITE HAMBURGH.

short close bunches, and are replete with a very sweet juice. The skin being thin and very subject to crack, it is an inferior grade and hard flesh. As this species is a very plentiful bearer, and forms large bunches, it is much admired by some, but is not so valuable as either of the two preceding kinds. It is sometimes called the *Portugal Grape*. *

The berries of this species are large, inclining to an oval figure, and of a black colour.

21. MALVOISE.

The berries of this species are small, rather inclining to an oval figure, and of a brown colour. The skin is thin and the flesh delicate, replete with a vinous juice. As the berries are powdered with a blue bloom, it is sometimes called the *Blue Tokay*. *†

22. GENUINE TOKAY.

The berries of this sort are of a dark red, with thin skin and juicy delicate flesh.

This is a white grape. The berries incline to an oval figure, and grow rather close on

the

the bunch; which is of a moderate size. The skin is thin and flesh delicate, abounding with a very agreeable juice. This species is very distinguishable by the foliage, the under side of the leaf being covered with a fine soft down, having the appearance of fawn. This species was sent to his Grace the Duke of Portland from Hungary, some years ago.

23. LOMBARDY. This has a large berry, inclining to an oval figure, of a beautiful flame colour. The bunches are regularly formed with shoulders, and frequently arrive to the weight of six or seven pounds. The leaves are much more divided than most other sorts, and the upper surface is of a deep green colour. This is by some called the Rhenish Grape, and by others the Flame-coloured Tokay.

24. SMYRNA GRAPE. This has a large red-coloured berry of an oval figure, with thin skin and delicate juicy flesh. It forms long bunches with shoulders loosely

loosely connected. The leaves in autumn die with purple edges. This is a good grape, though but little known in this country. *†

25. BRICK GRAPE.

The berries of this species are small, inclined to an oval figure, and of a pale red or brick colour. They grow close on the bunch, which is very small. This is a very sweet grape, but not much esteemed. ††

26. BLACK SPANISH OR ALICANT.

The berries of this species incline to an oval shape, are moderately large and black, and form exceeding long unshouldered bunches. The flesh is soft, juicy, and of an agreeable flavour. The leaves in autumn are beautifully variegated with red, green, and yellow. This is a pretty good fruit, and is sometimes called the Lombardy Grape. *†

27. WHITE

27. WHITE MUSCADINE, OR CHASSELAS.

This has a round white berry, is moderately large, with a thin skin, and delicate juicy flesh. The bunch is well formed, and of a pretty good size. This species is generally propagated against common walls; and as the fruit is constantly eaten before it is well matured, it is rather in disesteem: But still, when well perfected, it is an exceeding fine grape. The same observation might have been made on the *White Sweetwater*, with equal propriety. *††

28. BLACK MUSCADINE.

The berries and bunches of this species are both somewhat smaller than the preceding. This is a very prolific grape, and makes a fine appearance, on account of the black berries being powdered with a bluish bloom; but the flesh is not so delicate and juicy as the former. I procured a plant of this grape from *Holland* by the name of *Frankendale*. *†

29. ROYAL

329. ROYAL MUSCADINE, OR *D'arboyce*.

This has a round white berry, of a moderate size, a thin skin, and a juicy soft flesh. The bunches are generally exceeding large, sometimes arriving to six or seven pounds. This species is very distinguishable by the wood and foliage, generally growing remarkably gross and strong.

330. MALMSEY MUSCADINE.

This seems nearly allied to the preceding, but the bunches and berries are somewhat smaller, and the juice of a higher flavour, being remarkably sweet. However, as I have only seen the fruit of this sort from a plant growing in a pot, an allowance for the size of the bunches should be made.

331. CLARET GRAPE.

The berries of this species are small, black, and inclining to an oval figure; they grow close, and form small bunches. The juice is of a blood-red colour, of a harsh taste,

taste, excepting the grapes are perfectly matured, and then it may be considered rather as an agreeable delicate fruit. The leaves change from green to a russet-red early in summer, and die a deep red in autumn.*†

32. SYRIAN GRAPE.

The berries are white, large, and of an oval figure; the skin is thick, and the flesh firm and hard; the bunches well formed, and enormously large. Now, though this is generally considered as a coarse fruit, it has properties that ought to introduce it into every large collection, and especially the Hot-house. It is very prolific, and the bunches commonly grow very large, making a most noble appearance, and, when well perfected, may be called a very eatable fruit; to which I may add, that they may, without difficulty, be kept many weeks longer than any other sort. I have often had them in good perfection in the month of January, and sometimes even in February.*

B

33. MILLER'S

33. MILLER'S BURGUNDY.

The berries are small, rather inclining to an oval figure, are black, and grow close on the bunch, which is commonly short and small. The skin and flesh are delicate, possessing a sweet and pleasant juice. The leaves are distinguishable from most others by a hoary down, especially when young, being then almost white. ††

34. SMALL BLACK CLUSTER.

The berries and bunches of this species are little different from the former, but the leaves have less down and are somewhat smaller. This is a delicate sweet fruit, and is sometimes called the Burgundy Grape. ††

35. LARGE BLACK CLUSTER.

The berries of this are large, and grow more oval than the two former species, are black and not so delicate, the juice being of a harsh and rough taste. The leaves in autumn,

tumn, when dying, are of a beautiful bright scarlet. This species was sent me from Lisbon, and I was assured it is the identical grape of which red Port wine is made. †

36. WHITE MORILLON.

This has an oval white berry, of a moderate size, with thin skin and delicate juicy flesh. It grows close on the bunches, which are small. The leaves are soft, being greatly covered with down on the underside, something similar to the genuine Tokay grape, to which it appears nearly allied.

37. EARLY BLACK JULY GRAPE.

This has a small black round berry; the bunches also are small, but it is a prolific bearer, and comes to the table at an early season, even without fire heat. ††

38. CAT'S GRAPE.

This has a small oval berry, of a greenish white colour, with a thin skin and soft juicy flesh.

flesh. The berries grow close, forming small bunches. The taste of this fruit, before it is quite matured, is exceedingly disagreeable; but, when perfectly ripe, is very sweet and pleasing to some palates. *†

39. BLACK RAISIN GRAPE.^b

The berries of this species are large, oval, and black, with a thick skin and a hard firm flesh. It forms long handsome bunches. *

40. WHITE RAISINS.

The properties of this grape are nearly similar to the preceding, but the berries are white. *

41. DAMSON

“ Raisins are of two sorts; those which are called sun-raisins are made thus: When the grapes are almost ripe, the stalk is half cut through, so that the sap may not penetrate farther, but yet the bunch of grapes may remain suspended by the stalk. The sun, by darting on them, candies them, and when they are dry they are packed up in boxes.

“ The

41. DAMSON GRAPE.

The berries of this species are very large, oval, and of a beautiful purple colour. They grow loose on the bunch, which is large. The leaves of this grape are large, and more thick and succulent than those of

any

“The second sort is made after the following manner: When the Vines are pruned, the tendrils are preserved till the time of vintage; a great fire is made, wherein those tendrils are burnt, and in the lye, made of their ashes, the newly-gathered grapes are dipt,* after which they are exposed to the sun to dry, which renders them fit for use.”—*Travels through Portugal and Spain, 1772 and 1773, by Richard Twiss, Esq. F. R. S. p. 334.*

* Mr. Swinburne, in his travels through Spain, p. 208, informs us, that the raisins dried upon the coast of Valencia are dipped in a lye of wine and ashes,

The same ingenious author says, p. 167, “Immenſe are the hoards of all species of dried fruits, such as figs, raisins, plumbs, &c. They have also the *secret* of preserving grapes, sound and juicy, from one season to another.”

It is much to be regretted that this Gentleman could not procure and import the above most invaluable *secret*.

I have constantly kept grapes a long time by the following method; Before the autumnal frosts have killed the
Vine

any other sort, and have something of the appearance of green leather.*

42. EARLY WHITE GRAPE FROM TENERIF.

The berries of this species are round, white, and of a moderate size, with thin skins, and delicate juicy flesh of an extraordinary sweetness. The berries and bunches much

Vine leaves, let the bunch with the shoot be carefully cut off the Vine. Then put the lower end of the shoot into a bottle filled with water: Hang up the bottle with the shoot and bunch in a warm room. A Green-house is a very proper place.

Only two or three joints of the shoot above the bunch should be left, but a sufficient length below, to reach the bottom of a quart bottle, will be required.

The bottle should be filled with fresh water every twelve or fourteen days; and at the same time a thin shaving should be cut off the bottom of the shoot, whereby the pores will be made to imbibe the water with greater facility.

Grapes produced in Pine-stoves require to be cut at the pruning season, viz. in December.

By this method I have often kept grapes fresh and good till the middle of February.

much resemble the common Muscadine, to which it appears to have a near affinity. ††

43. ST. PETER'S GRAPE.

This has a pretty large berry, nearly globular in figure, and of a black colour; the skin is thin, and the flesh very delicate and juicy. This Vine produces large bunches, but as the berries are very subject to crack, it is not generally planted in forcing-houses. The leaves are much more divided than those of most other forts. †

44. BLACK GRAPE FROM PALESTINE.

This appears nearly similar to the preceding. But I have only seen two bunches of this grape, the product of a plant growing the last summer in a pot, and engrafted last spring; and though its situation was in the Hot-house, not a single berry cracked in either of the bunches; it may probably, therefore be a distinct species. *†

45. WHITE

45. WHITE PARSLEY-LEAVED GRAPE,
OR CIOTAT.

This is a species of the parsley-leaved grape. The berries are round, white, of a moderate size, with thin skins and delicate juicy flesh, which is very sweet, but not of a vinous flavour. The bunches are of a pretty good size, almost similar to the White Muscadine. The leaves are finely divided, differing from any other sort.—There is a species of the Parsley-leaved Grape which produces *red* berries. †

46. BLACK LISBON.

This has a large globular berry, black, thin-skin'd and juicy. It has also large-shouldered bunches, which not a little resemble the Black Hamburgh. It is a pretty good grape, but scarce in this country. *†

47. GREEK GRAPE.

The berries of this species are of a moderate size, rather inclining to an oval figure,
of

of a bluish white colour, and grow close, forming moderate-sized handsome bunches. The leaves grow on very short foot-stalks, and bear a resemblance to those of the *Sweet-water*. It is a delicate and justly-esteemed fruit. *†

48. WHITE CORINTH GRAPE.

This has rather a small white round berry, with a thin skin, and very delicate juicy flesh, of an agreeable flavour. The bunches too are rather small. The berries, when perfectly ripe, are transparent, so that the seeds appear very distinctly. †

49. WHITE MUSCAT, from *Lüneburg*.

The berries of this species are large and oval, and, when perfectly ripe, are of a fine amber colour, sometimes clouded with brown or russet, especially on the side next the sun. The skin is thin, and the flesh delicate, replete with a vinous juice. As this grape is a very plentiful bearer, and forms pretty large bunches, it may justly be deemed a valuable sort,

fort, though at present but little known in this country. *†

50. CORNICHON.

This is a remarkable formed grape. The berries are above one inch and a half long, their breadth not half an inch. They taper from the stalk, (but not in a regular manner) and end in a blunt point, according to the French, something like a horn: But its figure is more like the long end of a small fish's bladder. The berries are white, with a thick skin and a firm sweet flesh. *

I might add to the foregoing list, two or three seedling grapes that have borne fruit; one of them is the produce of the Black Frontinac, impregnated by the White Sweetwater, and may be considered as a valuable fort. The berries are black, like its parent, but the bunches are composed of unequally-sized berries, like the Sweetwater, and ripen early in the season.

I have not attempted to place the various forts in the foregoing list, according to the
due

due order of their ripening, because the late kinds are the fittest to be propagated in the Hot-house, which in this work is to be considered as the first object.

It might, by some, perhaps be expected that I should announce the flavour of every sort of grape here mentioned and described: But I am very reluctant as to that particular, as person's palates are so very various; and I have frequently found and observed, that many sorts of grapes, which have by some been highly commended, have, by others, been greatly disapproved.

I shall here beg to remark, that I have observed that the leaves of white grapes, in general, when mature, constantly change to a yellow colour, and are never in the least tinged either with purple, red, or scarlet. The leaves of the Claret Grape change to a dark purple and russet green early in the season. Those of the Blue Frontinac and Black Muscadine, change late in the season to a beautiful scarlet and yellow, intermixed.

The leaves of the Aleppo Grape are curiously striped with red, green, and yellow:
The

The Muscadet, Smyrna, Morocco, Black Damascus, Grizzly Frontinac, and the Black Spanish or Alicante, are also exceedingly beautiful.

The leaves of the pale red and Grizzly Grapes are not always tinged with red; but whenever the least tinge of red, purple, or scarlet appears on the leaves of the vine at the time of their maturation, it is a certain criterion that the grapes will be either of a grizzly, a red, or a black colour. By a strict attention to this remark, a person may be enabled to ascertain the colour of the grapes of Seedling Vines at the end of the first year.

Although the situation and climate of this country be too unfavourable for bringing the best kinds of grapes to perfection in a natural way, yet, by artificial means, we are enabled to carry even the latest ripening sorts to almost as high a degree of perfection as in any part of the globe.

The most certain methods of obtaining grapes in perfection in this country, are either to propagate the Vines in pine stoves,
or

or against flued walls covered with glass,
commonly called Vineries.

In some seasons there are many kinds of early grapes brought to a tolerable degree of maturity against common walls; but even in a tolerable propitious season, the best sorts of grapes thus produced are of little value; whereas even the latest sorts, when propagated in a pine stove or vinery, seldom fail of producing crops of well flavoured grapes.

The management and method of training Vines in the Hot-house being very different from that of propagating them in a Vinery, it will be proper and expedient to treat the two modes separately.

ON THE
MANAGEMENT

VINE IN THE HOT-HOUSE.

IN the first place, situation and soil are maturely to be considered. Every Hot-house should either be built on a dry soil, or where the situation is capable of being made so; because it is absolutely necessary that the pine pits should be perfectly dry: And these are generally to be sunk about four feet below the surface of the circum-jacent ground, on the outside of the building. There should be a drain in the front of the stove to carry off the water that falls from the roof; and this drain should be as low as the foundation of the building, and close adjoining its front wall.

If

If the ground be wet or springy, the soil either a barren sand or cankered clay, it will be requisite to use all necessary expedients to prevent the roots of the Vine from entering into them; and as they are to be planted immediately over the drain adjoining the front of the Hot-house, it will be indispensably necessary also to make the drain perfectly secure both on the top and sides.

Parallel to the drain adjoining the front of your Hot-house, another drain should be made at the distance of 18 or 20 feet, and this ought to be sunk six or eight inches below the level of the former drain; the bottom floor of the vinery will then admit of an easy descent, so that the water may readily be drawn off from the roots of your Vines.

When the soil comes under any of the above descriptions, a bottom floor should be made to prevent the Vine-roots from penetrating it: This floor must be made of such materials as chippings of stone, coarse gravel, broken bricks, &c. and these must be laid quite as low as the bottom of both the drains, and to the thickness of eight or ten inches. They

They should be well beaten together and made smooth.

Over these materials, or foundation, there should be put a thin layer of fine loamy soil, quite free from swarth or stones. This should be well watered, and worked over with a spade till it is quite soft, so as to have the appearance of a fluid mass; for then it will entirely fill up the chinks in the under-bed of stone, &c. and also form a covering, and unite with it so thoroughly, as to make and compose a firm bed, almost as impenetrable as a rock.^c

In many places Hot-houses are built where the soil is of so unfavourable a nature, that it would be next to impossible to have Vines in perfection without the above contrivances and precautions; for when the soil is wet and springy, as stated above, is a strong clay, or otherwise unkindly, the Vine-roots by penetrating

^c This method of tempering soil is in general practice with engineers and persons employed in making navigable canals or large pieces of water. It is by them termed "puddling," and is deemed the best expedient hitherto found out to render ground water-proof.

trating deeper than the sun's influence, will imbibe crude particles, which will not only tend to render the Vine unfruitful, but also impregnate its small produce of grapes with a disagreeable flavour : But when the above directions are strictly attended to, there will be a certain space of six or eight yards in breadth, and the entire length of the stove, made perfectly secure from all noxious and heterogeneous matter. Therefore the next important object will be a consideration of a proper soil or compost.

As the Vines in the Hot-house at Welbeck have been remarkably fruitful and vigorous, I shall beg leave to recommend the same kind of compost-mould which I make use of there; viz. one-fourth part of garden mould, (a strong loam); one-fourth of the swarth or turf from a pasture where the soil is a sandy loam; one-fourth of the sweepings and scrapings of pavements and hard roads; one-eighth of rotten cow and stable-yard dung mixed; and one-eighth of vegetable mould from reduced and decayed oak leaves. These are the several and respective proportions. The swarth should be laid on an heap, till the grass roots are in a state of decay, and

then turned over and broken with a spade; let it then be put to the other materials, and the whole worked together, till the separate parts become well and uniformly mixed and incorporated.

If this business were to be done previous to the building of your Hot-house, it would be advisable to bring the above prescribed materials directly to the spot, and there to mix and mingle them well and sufficiently together, by working them over in the manner of trenching. I will not take up the reader's time in the explanation of any kind of process generally known. In the present case, therefore, it may suffice to say, that before the Vines are planted, it will be perfectly necessary that all the ingredients above mentioned should be completely combined, and so thoroughly mixed, as to constitute a mass perfectly uniform and homogeneous.

Let us now suppose the compost-mould to be ready upon the spot. There let it be raised above the upper margin of the drain adjoining the front wall of the stove, to the thickness of two feet and six inches. The whole space between the two drains must also be

be raised to rather above that level. As the preparing and finishing the ground in question leads to an important object, and as it should be covered with gravel, and lie in an undisturbed state for some time after it is planted, I am desirous of being a little more explicit respecting the formation of your floor or bed.

I have already observed that the floor has a fall or descent of six or eight inches, inclining to the South; and here I would recommend, that the surface of the ground upon it should, when finished, be reversed, that is, that the part at some distance from the Hot-house should be raised five or six inches above the level of the ground immediately adjoining the stove. The ground at each end should also be brought to the same height. In short, the surface of the whole should have an easy fall of two or three inches to a certain point, where a grate should be fixed, to take off the water that falls from the roof of the Hot-house. About the middle of the front wall will be the most convenient place for this purpose, as the ground at each end may be raised to have an easy fall into it. The grate must be laid in a

groove cut two inches deep in a smooth stone; and a second groove, one inch and a half deep, must be cut round the former. The intent of this latter groove is to receive a board, which must be made to go in and fit very close, so as to afford an opportunity of floating the ground in front occasionally: But of this I shall have occasion to speak more at large hereafter. The stone I here speak of must be laid immediately over the drain, adjoining the front wall of the stove, and raised about two feet three inches above the top of the said drain. The ground, including a thin coat of gravel, of about two inches thick, must be laid perfectly even with the top of the stone, which is the central point for drawing off the water from the surface of the whole.

The ground should be made complete some months before it is capped with gravel, as it will settle very considerably; and, during the time of settling, boards should be laid over it for persons to walk upon, when they are to give air to the Hot-house, &c. Since, otherwise, the ground would be trodden down unequally by their going over it. Your ground being now complete, by allow-

ing

ing proper time to settle, let the whole of the surface be pointed over with a spade to the depth of three or four inches; and at the same time add fresh compost to make up the deficiency of its settling. Then tread it firm and rake it smooth, and lay the gravel about two inches thick upon every part, except the very places where the Vines are to be planted. Tread also the gravel and rake it smooth; after which a light roller should be run over it, and thus the whole business of the preparation will be finished. However, I shall just add, that if the gravel were made fine, and afterwards divested of the sandy particles, which may easily be done by twice screening or sifting, it would make the walk in the front of the Hot-house both neater and better; for when the gravel is of a sandy nature, it is not only inclinable to grow soft in a wet season, but the small particles of it are also liable to be blown upon the roof of the Hot-house in dry windy weather.

It may seem unnecessary to observe, that as the depth of the mould adjoining the front wall of the stove is two feet six inches, and the depth at the South drain three feet six inches,

inches, the whole will run at the medium depth of one yard: And as the breadth of the floor, eighteen feet, and the Vines standing at three feet six inches apart, the distance between the rafters, each plant will occupy, at an average, a space containing seven superficial yards, and, consequently, as many cubic yards of compost.

Having thus gone through with the preparation of the ground where the soil and situation are both unfavourable, I shall now endeavour to give a few hints that may be useful, when either of these articles are differently and better circumstanced.

A garden, and consequently the Hot-house, is sometimes so happily situated in regard to soil, that it seems, by nature, adapted to the growth of the Vine.^d The best soil, in my apprehension,

^d The following extract from Virgil, on this topic, will be deemed neither unapplicable nor disagreeable to the candid reader:

The nature of their several soils now see,
Their strength, their colour, their fertility;
And first for heath, and barren hilly ground,
Where meagre clay and flinty stones abound;

Where

apprehension, and indeed the soil in which I have known the Vine to prosper in the most superlative degree without artificial aid, was a kind of rich sandy loam, intermixed with thin beds of materials of jointed slate, or stone, so very soft in its nature as almost to be capable of being crumbled between the fingers. The roots of the Vine delight in these beds of loam.

I have been more particular in the above description, on a supposition that spots of such

Where the poor soil all succour seems to want,
 Yet this suffices the Palladian plant.
 Undoubted signs of such a soil are found,
 For here wild olive-shoots o'erspread the ground,
 And heaps of berries strew the fields around.
 But where the soil, with fat'ning moisture fill'd,
 Is cloth'd with grass, and fruitful to be till'd :
 Such as in chearful vales we view from high ;
 Which dripping rocks with rolling streams supply,
 And feed with ouze ; where rising hillocks run
 In length, and open to the Southern sun ;
 Where fern succeeds, ungrateful to the plough,
 That gentle ground to gen'rous grapes allow.
 Strong stocks of Vines it will in time produce,
 And overflow the vats with friendly juice ;
 Such as our priests in golden goblets pour
 To gods, the givers of the chearful hour,

Dryden's *Virg. Georg. ii.*

such kindly materials may sometimes be found; and whenever it so happens, I would, by all means, recommend a plentiful use of such soil in preference to any other, and especially for the part below; for even in the former case of the unfriendly soil, the Vines would possibly succeed still better with a layer of this sort between the compost-mould and bottom floor.

When either a Pine and Vine Stove, or a Vinery, are intended to be made, and the soil happens to be such as has been described, or similar to it, and especially if the bottom be a dry bed of strong gravel, a kind of slate stone, or rocky, an artificial floor in either case will be unnecessary, since the pine pits need not then be sunk below the natural soil, as in the common method, but raised above it. The ground on the out-side of the building must afterwards be brought up to a convenient level, and it will then form a kind of terras or balston. By this means the roots of the Vine will be benefited in a double respect, both by an additional soil, and by having the natural one for its bottom or floor.

I do

III. do not in all cases recommend the various proportions exactly, for making the foregoing compost, but would advise, nevertheless, that each be varied in a greater or less degree, according to its quality. Nay, it sometimes may be found necessary to substitute a soil still different from either of the foregoing. As when, for instance, a garden soil happens to be rich, strong, and inclinable to clay, and when a sandy loam cannot conveniently be had; for in such a case, common sand, or rather the reduced swarth or turf from a sandy soil, although poor in its nature, will not only correct, but greatly improve it, by opening its pores, and rendering it light, and thereby making the passage more easy for the progress of the roots of the **Vine**. It appears a contradiction in terms, I confess, to say that a good soil will admit of being improved by a mixture with a bad one, but yet so it is, since although you may conceive the primogenial soil to be sufficiently good and proper for the purpose, it is nevertheless,

The spontaneous fruitfulness of the ground was a thing peculiar to the *primogenial* soil, (by which I mean the original mould at the creation and after the flood) for that was

theless, evinced by experience, that it will admit of improvement, and will be much benefited by having the various soils above-mentioned judiciously mixed and well worked together.

As the vegetable mould from decayed leaves, which I just mentioned above, cannot always be obtained, by reason that the leaves require to lie two years before they become sufficiently putrid and reduced; it therefore may sometimes be necessary to substitute some other ingredient in lieu of this part of the compost; wherefore it may not be inexpedient to point out the proper succedanea.

Rotten

so tempered as to be more luxuriant than it could ever be afterwards; and, therefore, as that rich and proper temperament was spent, so by degrees it grew less fertile. "The fruits of the earth were, at first, spontaneous, and the ground, without being torn and tormented, satisfied the wants and desires of man. When nature was fresh and full, all things flowed from her more easily and more pure, like the first running of the grape, or of the honeycomb; but now she must be pressed and squeezed, and her productions taste more of the earth and bitterness."—*Burnet's Theory of the Earth*, vol. i. page 225.

Rotten wood reduced to a fine mould, such as is often found under faggot stacks ; the scraping of the ground in old woods, where the trees grow thick together ; mould out of hollow trees, and saw dust, reduced to a fine mould, provided it be not from wood of a resinous kind, are, in part, of a similar nature with vegetable mould from decayed leaves, but are neither so rich nor powerful, because the vegetable mould receives a power by its fermentation, as I have observed in the section on the use of oak leaves.

It is very probable that there are various other kinds of manure, that may be introduced into a compost suitable for the Vine, with as much effect as the former ; as blood, the offal of animals, or shambles manure, horn shavings, old rags, hair, shavings of leather, and bone dust. This last is exceedingly proper, as at the same time that it gives a lightness to the soil, it contributes to its fertility. I may also add to the former, the dung of deer and sheep, as likewise human ordure. But please to observe, that many, if not all, of the above recited manures, will require time to meliorate, before they can

can be introduced and incorporated with the other parts of the compost ; wherefore being collected, and mixed with garden mould, they may be thrown up in an heap, in any convenient place of your garden. A winter's exposure, with frequent turning over during that period, especially in frosty weather, serves wonderfully to meliorate and hasten their dissolution. The influence of a summer's sun will not be less beneficial, by exhaling their crude particles, and, by sweetening the parts, preparing them the more immediately for vegetation.—Having recommended so large a proportion of the dirt, or scrapings, of hard roads and pavements, to enter into the vineal compost, it may not be improper to bring this material again under consideration.

The dust, or dirt, from roads, consists principally of the following particulars : First, the soil of the vicinity ; secondly, the dung and urine of horses and other animals ; and thirdly, the materials of the road itself when pulverized. Various other matter may be brought by winds, and by other means, but the foregoing may be deemed the principal. The first of the above articles is brought to roads

roads by the wheels of carriages; and the legs of horses and other animals; the last is the worst part of the materials, as the dust and scrapings from roads, made and mended with soft stone that grinds fast away, is much inferior in its vegetating quality to that which is collected from hard roads. On the whole, however, this ingredient of compost from the roads is unquestionably in general of a fertile nature, which may be attributed in part to the dung, urine, and other rich materials of which it is composed; and, in part, to a kind of magnetic power, impressed upon it by friction, and its perpetual pulverization.

The
 "I think it would be evinced, as constant and undeniable, that, amongst the mechanical aids, (wherein ster-
 coration has no hand) that of pulverizing the earth by
 contusion, and breaking it with a plow or spade, is of ad-
 mirable effect, to dispose it for the reception of all the na-
 tural impregnations. For the earth, especially if fresh,
 has a certain magnetism in it, by which it attracts the salt,
 power, or virtue, (call it either) which gives it life.
 Take of the most barren earth you can find, drained, if you
 please, of all its nitrous salts and masculine parts, reduce
 it to a fine powder, (which may be done, even in large
 proportion, by a rude engine, letting fall a kind of ham-
 mer,

The nature of this road-earth ought to be duly considered when used with the Vine-compost, and its proportion adjusted according to its quality. In a sandy country it will naturally abound with particles of sand, and long and continued rains will, of course, wash away its best parts. High winds too, in dry weather, will as certainly deprive it of its lightest and finest parts, especially when roads lie on eminences, or enjoy an open exposure. Those materials, therefore, from roads, are generally preferable, which are

produced (mer, or beetle, at the motion of a wheel) let this pulverized earth, and for the time incessantly agitated, be exposed, for a summer and winter, to the vicissitudes and changes of the seasons, and influences of heaven. By this labour and rest from vegetation, you will find it will have obtained such a generous and masculine pregnancy, within that period, as to make good your highest expectations; and to this belongs Sir Hugh Platt's contrition or philosophical grinding of earth, which upon this exposure alone, without manure or soil, after the like revolution of time, will, as he affirms, be able to receive an exotic plant from the farthest Indies, and cause all vegetables to prosper in the most exalted degree; and to bear their fruit as kindly with us as they do in their natural climates." For a further account of this curious and important subject, see page 27 of the last edition of Evelyn's *Terra*, with Notes by Dr. Hunter.

produced from an inclosed track in a low situation : Pavements, however, and hard roads, produce the best fulture of all. This compost is much better when collected in a moderate dry state, than when it is very wet or dusty. If scraped off the road in a wet and soft state, when it is become dry it will require time to bring it to a proper condition. When thus circumstanced, the best way of recovering it is to give it frequent turnings in hard frosty weather.

The dust and scrapings of roads are not only proper for Vines, but also agree with plants in general, and being mixed in an equal

* In some kinds of moory or fenny soils, it formerly was found difficult to get sets of either the Willow or White Thorn to strike root, though it was observed, that the few plants of both, that chanced to take, generally grew remarkably luxuriant afterwards, and were very durable.

It is probable, that such soils greatly abound either with a sulphurous or an unctuous quality, so as to overpower the plants when newly set.

The scrapings of roads, and the dirt of streets, are found to be effectual in remedying this complaint,

In

equal proportion with vegetable mould from decayed leaves, make an excellent compost for most kinds of plants that grow in pots.

After having specified various kinds of manures that are known to be friendly to the Vine, it may not be improper to mention some others that seem to be hurtful and inimical to itⁿ. Soot, wood-ashes,

pigeon

In some parts of the Isle of Ely, and the adjacent low and moist country, it is now become a general practice to carry the road-earth many miles for this purpose. At the time of planting a few handfuls of this substance is put round each let, and a quantity just sufficient to keep the natural soil from touching the bark of the plant, is found to be quite adequate to the purpose. By this mode of practice, numbers of willow trees are raised with the greatest certainty, and fine white thorn hedge-rows now form and furnish the boundaries of those inclosures, which, formerly, were only separated by ditches, to the great benefit, as well as ornament, of the country.

My own eyes have been witnesses of the above curious and important fact; and I have a brother, who, at this day, occupies a farm in that country, and still pursues this mode of practice.

“And here the nature of the land should be maturely considered, for we should endeavour, by all means, to detect, as far as we are able, the quality predominant, both of

pigeon and hen's dung, would all, I think, be too hot for the root of the Vine. These, if you please to consider, are manures that come immediately into action; and, therefore, are more properly calculated for top-dressing, and to enliven the surface, than to be buried at the roots in the ground below. Pond-mud and moor-earth would probably, on the contrary, be too cold for that purpose; and the latter, perhaps, be liable to canker the roots of the Vine; and therefore, on that account, had better be omitted. These auxiliaries would, doubtless, be very proper for gardens, planted on a sandy soil, and mixed, as we will suppose, with the common soil of the quarters that produce crops of vegetables for culinary use. Stable-yard dung would be too spirituous, hot, and fiery, were it to be introduced into the compost,

of the earth we should improve, and the compost we apply, and not throw them promiscuously upon every thing, without considering of what temper and constitution they be, for grounds are as nice as our bodies, and as obnoxious to infirmities upon every defect and excess; and, therefore, it requires skill and no little study to be able rightly to marshal this *materia medica* (as I may call it) of composts, the virtue of which does sometimes, lie very hidden."

Evelyn's Terra, p. 54.

post, before its heat was thoroughly abated ; and, I fear, it would be liable, by its sinking, to cause the border to settle too much after the gravel was laid upon it.

I am fully persuaded that the Vine is frequently injured by the common custom of putting improper dung into the borders, for dung should not be permitted to approach the roots, till it be perfectly reduced to a kind of black mould.

Lime will, it is said, lend a friendly aid to the Vine ; and, indeed, it is possible that some kinds of lime may possess that useful quality, for lime differs as much in its nature as land does. Lime made of the *peak* stone is of a rich and mild quality, and is used, with the greatest success, as a top-dressing for grass-lands, and its good effects are very lasting ; indeed, it is asserted, that land will be benefited by a coat of this lime for the space of eighteen or twenty years. This species of lime might, in all probability, be of great service, if admitted into the Vine-compost ; but I am persuaded that there is something too powerful, if not pernicious, in lime of a different quality ; and that

Vines

Vines are greatly injured by the common practice of laying lime-rubbish for the bottom floor in the preparation of the ground ; this floor being intended to give a check to, but not to injure the roots of the tree. On this account it would be prudent to discard the use of it in this mode of application.

Having thus duly considered the various soils, manures, and compost, and shewn which are the most salutary for the Vine, and which ought to be omitted ; and having given such directions, as, I am willing to hope, will be found ample and sufficient to enable a person to proceed with fair hopes of success, in most soils or situations : I shall now proceed to lay down and describe the most eligible method of raising Vine-plants. And here I am extremely happy in having something, not less important than new, to communicate on this subject ; indeed I should be extremely reluctant to offer any method, different from the general mode of practice, merely on account of its novelty ; but novelty, when attended by superior excellence, is, certainly, a great recommendation.

The Vine admits of being propagated various ways: First, by seeds; secondly, by layers; and, thirdly, by cuttings.—This tree can also readily be propagated by grafting and inoculation.

The Vine may be easily propagated by seed; for seed, carefully preserved through the winter, rises very freely, and especially from the seed of grapes brought to early maturity.

This, undoubtedly, is the only way to obtain new kinds of grapes; but, nevertheless, it is little practised, partly on account of the distant prospect and length of time, and partly from the hazard of obtaining better kinds than the original grapes from whence the seeds were taken. The prospect, however, is not so distant as many persons may imagine; for a seedling Vine, judiciously managed, will produce fruit the third or fourth year; and as to the doubtfulness of obtaining better sorts of grapes than the original, it certainly will be but too well founded, should you make your experiment with seed indiscriminately sowed; but when proper care and attention is had to the seed you sow, the

the prospect will wear a more favourable aspect, and the very best species may be hoped for, and reasonably expected.

When Vines are intended to be raised from seed in hopes of procuring new kinds of grapes, that design ought ever to be kept in view. In Hot-houses, where various sorts of Vines are trained, it is an easy matter to bring the branches of two different kinds together, and it may be best done at the time of pruning. As soon as the Vines shew their fruit, the young branches of each should be so brought together, that the bunches of two different kinds, in the same state of maturity, may admit of being entwined; whereby the two bunches being in flower at the same instant, and the parts of fructification brought together, there will, undoubtedly, be a mutual impregnation, from which it may reasonably be expected, that new and improved kinds of grapes will be produced.

Great regard, however, should be had in respect of the sorts intended to be brought together, and the advantages to be gained by this junction should be duly considered.

They

They are principally the following : First, a superiority in size, both in the bunch and the berry ; secondly a superior excellency in flavour, and a delicacy in the skin and flesh of the fruit. The form of the bunch, and the length of the foot-stalk of the fruit, are also valuable objects, and ought to be considered as advantages, close-growing grapes, which always have short foot-stalks, being subject to many misfortunes.

The advantages to be gained by this method of proceeding being thus shewn and displayed, I shall beg leave to make a few observations on the manner of reducing it into practice. And the hints once given, it will be at the option of persons of taste and genius to run the parallel agreeably to their own fancies.

All the five sorts of *Frontinac* grapes are proper to add an excellency of flavour to other kinds ; but there is a superior richness in the *black*, *blue*, and *red* Frontinacs, and they do not partake so much of the strong muscat flavour as the *white* and *grizzly* do. But it must be considered, that the *blue* Frontinac grows close upon the bunch, and, therefore,

therefore, is only proper to be coupled with the loose-growing kinds that have long foot-stalks. The white Muscat of *Alexandria* produces large loose-growing bunches, and the berries being very large and well flavoured, it must be a proper kind to be joined with many other sorts. There is a peculiar delicacy in the flesh of the white *Sweetwater*: It is also a remarkably thin-skinn'd grape, with large berries; consequently it is a proper kind to couple with various sorts that are small and less delicate. Were the red *Frontinac* and white *Sweetwater* wedded together, their union would, probably, produce a very valuable sort, as there would be a good chance of its being both large and delicate, and well-flavoured. The Syrian Vine is only admired for producing most astonishingly large bunches,ⁱ and, therefore, I would not advise

ⁱThis is supposed to be the sort of grape alluded to *Numbers* xiii. 23. as it sometimes produces bunches of eight or ten pounds weight and upwards. In the year 1781, a bunch was produced at Welbeck that weighed 19 pounds and an half. It was presented by his Grace the Duke of Portland to the late Marquis of Rockingham, and was conveyed to Wentworth-House (a distance of more than 20 miles) by four labourers who carried it suspended

advise the joining this coarse sort to any other except the following, as in all likelihood the offspring would only produce bunches much less

pendent on a staff, in pairs, by turns. Its greatest diameter, when hanging in its natural position, was 10 inches and an half; its circumference four feet and an half; and its length 12 inches three quarters.

The following curious and important note on this extraordinary bunch was written at that time by my much-esteemed and learned friend the Rev. Samuel Pegge of Whittington, by whose permission it is here inserted :

“ Our fruits, as well as our animals, are always found
 “ somewhere in a natural state, and so we read of
 “ *wild grapes* in Syria, *Isaiab* v. 4. including Palest-
 “ tine, or the land of Canaan in Syria, as we are au-
 “ thorized to do.

“ The Vine, however, soon became an object of im-
 “ provement and cultivation, since Noah, after the
 “ Flood, *planted a Vineyard*, *Gen.* ix. 20. and from
 “ thence supposed, by several learned men, to be the
 “ Bacchus of the Greeks and Janus of the Latins;
 “ the name of this latter being derived from an orien-
 “ tal word, signifying *wine*.

“ This part of the world produced, anciently, both
 “ large grapes and large bunches; for when the
 “ Twelve Spies were sent by Moses, then in the
 “ Desert or Wilderness, to view and reconnoitre the
 “ Southern parts of the land of Canaan, they came
 “ unto the brook of Eshcol, and cut down from
 “ thence

less ponderous. But the white Muscat of *Alexandria* having large berries and longer foot-stalks, there would be a probability of producing

“ thence a branch with one cluster of grapes, and
 “ they bare it between two upon a staff, *Numb. xiii.*
 “ 23. How large the branch, cut with the cluster,
 “ might be, is not known; and, perhaps, this mode
 “ of carrying might be owing, not so much to the
 “ weight of the branch and its cluster, (since one
 “ man could very well carry both, though they
 “ should weigh 40 or 50 lb.) as that the cluster
 “ being to be exhibited, and shewn to the people on
 “ their return, it was necessary to preserve the fruit
 “ fair, whole, and unbruised: However, it is to be
 “ presumed, that the cluster was singularly large and
 “ fine, the tenor of the narration evidently implying
 “ that.

“ But as to the largeness of the bunches in this quarter
 “ of the world, Strabo, who lived in the reign of
 “ Augustus, testifies, that the Vines in Margiana
 “ and other places were so big, that two men
 “ could scarcely compass them with their arms,
 “ and that they produced bunches of grapes *two*
 “ *cubits* or a yard long, which is more than a foot
 “ longer than that vast bunch produced by his Grace
 “ the Duke of Portland at Welbeck.

“ We should, probably, have heard more of the en-
 “ ormous clusters of grapes growing in these Eastern
 “ parts, if the country, ever since the seventh cen-
 “ tury, when Abubeker over-ran it, had not been
 “ in the hands of the Saracens, who, being Moham-
 “ medans,

producing a kind between this and the Syrian Grape that would exceed the original parents both in size and flavour. Although the
black

“ medans, were not permitted the use of wine, and,
 “ consequently, would entirely neglect the manage-
 “ ment and culture of the Vine.

“ But though the Mohammedans of Syria did not pro-
 “ pagate the Vine, nor drank any wine but by stealth
 “ and trespass, yet there were always some Christians
 “ mixed amongst them, who took care to cultivate
 “ the tree for their own use, though they made not its
 “ juice an article of merchandize or of exportation ;
 “ and their clusters of grapes were often, no doubt,
 “ of the very largest size and dimensions. This may
 “ be inferred from what we find in Huetius, ‘ that
 “ Crete, Chios, and other Islands in the Archipela-
 “ go, afford bunches of grapes of 10 pounds weight ;
 “ sometimes of 36, yea of 40 pounds ;’ far exceed-
 “ ing the Duke of Portland’s bunch.

“ But still it is a most extraordinary Phenomenon in
 “ this country, that a Vine, though of the Syrian
 “ kind, should, by care and judgment, and proper
 “ cultivation, be made to produce a cluster of 19
 “ pounds and an half ; and it redounds much to the
 “ honour both of his Grace and Mr. Speechly,
 “ whose admirable skill in his profession is otherwise
 “ so well known to the public.”

Whittington, Oct. 10, 1781.

SAMUEL PEGGE.

black Hamburgh is a thick-skinn'd grape, with coarse flesh, yet it has many good properties : It is a fine vigorous growing Vine, that will stand forcing, and is a very plentiful bearer. The bunches too are generally large, and furnished with well-sized berries, of a tolerable flavour. These again having long foot-stalks, do not want much thinning ; and, therefore, are not liable to decay, as is the case with most close-growing kinds. If this sort were to be coupled either with the *white Frontinac* or *Sweetwater*, there is great reason to suppose that the offspring would be an improved kind.

The following kinds also admit of a junction with great propriety, viz. The *black Damascus*, and grizzly *Frontinac*—the flame-coloured *Tokay* and red *Frontinac*—the white Muscat of *Alexandria* and white *Sweetwater*—the black *Frontinac* and white Muscadine—the *St. Peter's Grape* and white Muscat of *Alexandria*.—It is probable that some of the foregoing advantages may be gained by an alliance between various other kinds ; but I shall forbear to recite any further examples, enough having already been said on this subject to stimulate persons of taste and curiosity,

to

to pursue an amusement that, one may venture to pronounce, will contribute both to their advantage and pleasure.

It is evident that the present very extensive variety of valuable kinds of grapes have been obtained from seed, either sown by hand and raised with care, or from seed accidentally let fall by birds, or by other chances, whilst the grapes continued in their wild state.

I shall go so far on this occasion, as to augurate, that the best sorts of grapes hitherto known, will, at some future day, be esteemed only as secondary or inferior kinds. Since we know that the collection of gooseberries have been improved by seed, within the space of a few years, to a most astonishing degree, surely, with the same care, attention, and public encouragement*, as much may be done

* In Lancashire, and some of the adjacent counties, public annual Meetings are established and held for the encouragement of increasing the variety of gooseberries, and premiums are annually given to persons that produce the best new kinds. The acquisition of the many new and valuable kinds of this species of fruit, which have lately been obtained from seed, may, in a great measure, be attributed

done in the list of Vines. This I can aver, that the method of raising seedling plants is neither uncertain nor difficult, as seed from grapes, perfectly ripe, will vegetate with the utmost facility and certainty. In this place it will be necessary to observe, that the bunches entwined together should be separated as soon as the *farina* has fallen, and the grapes begin to swell, as the important parts of fructification have then performed the office for which nature intended them, viz. the propagation and increase of the species.

The grapes for seed should be permitted to remain on the plant till they are perfectly ripe, as the seed is not till then quite matured, when it generally is of a very dark-brown colour. As soon as the seed is taken from the

tributed to this public incitement. The consequence is evident, that a similar establishment for the increasing the varieties of grapes, would, undoubtedly, be crowned with equal success. If such a plan as here proposed were established in various parts of the kingdom, and public notice given thereof, it would certainly excite the admirers of this elegant branch of gardening to exert themselves on the occasion. Let but the project be begun and tried, and, I am persuaded, that the success it would be crowned with, would soon make it a fashionable recreation.

the pulp, or flesh, of the grape, it should be laid on a sheet of paper, or the like, in some airy, but shady place, to dry, and then carefully preserved till spring. If, however, the seed were to be immediately sown, and the pots kept in the Hot-house, and moderate waterings given them during the winter, the plants would rise and come up in the spring : But the great disadvantage attending this method is, that the plants would be liable to come forward too early, and, of course, come weak. For although the seed would lie dormant during the winter, notwithstanding the artificial warmth of the Hot-house, yet as soon as the days began to increase, and the sun to regain his force, the genial warmth of his rays will soon, and, perhaps, too soon bring them up. It will, therefore, I think, be the most eligible to sow the seeds about the end of February, or the beginning of March.¹ For this purpose, let small pots
be

¹ The beginning of March seems to be the most proper season for sowing the seeds of plants in a Hot-house. In the spring it is customary to raise a succession of crops of Kidney-beans in most Hot-houses, which are generally sown at intervals of 10 or 12 days, from the middle of
December

be filled with very light, rich, sandy mould ; into each pot put eight or ten seeds ; lay them at regular distances, and press them into the mould with your finger to the depth of half an inch ; then fill up the holes, and make the surface of the mould smooth and even.

The pots should be plunged either in the tan-bed in the Hot-house, or in a temperate hot-bed, for a moderate warmth will, at that season of the year, soon cause the seed to vegetate. As soon as the plants appear, they will require, from time to time, gentle sprinklings

December to the beginning of May. I have constantly observed a very distinguishable difference in every crop, till the beginning of March ; each crop coming better, and growing more robust and vigorous than the preceding one. But, after the vernal equinox, the case alters, and the crops then come more weak, the plants growing tall, slender, and long-jointed.

I take it for granted, that the health, strength, vigour, and longevity of a plant, (perhaps, too, the same may be said of man) depends greatly on its good beginning. This remark may be deemed worthy the farmer's observation, as it will shew the importance and necessity of fixing upon a proper seed-time.

As

sprinklings of water, but this must be given them very sparingly, especially during the time they remain in that state; and should the weather prove either gloomy or rainy at that juncture, let the water be entirely omitted.

When the plants have so far advanced as to have three or four joints apiece, they must be carefully shaked out and planted each in a separate pot, filled with the same kind of mould as was before recommended.

The

As the sun's annual course is always the same, it necessarily follows, that the seasons of a Hot-house, where the air is confined, must be nearly so too. But in the open air the case is very different, and we find, by experience, that there are many weeks difference in vegetation, according to the lateness and forwardness of the spring. Hence no fixed time can, with propriety, be ascertained for sowing the spring corn and grass seeds, but nature's signs will be the farmer's surest guide. The leafing of trees, the state of the ground, and the weather, will, if well observed, afford the best directions to the farmer in this important business.

There are certain critical seasons in the spring, when all nature seems combined to promote vegetation; when the very air is big with impregnation, and the earth swells, as wishing for the descending shower.

The greatest care will be required in the performance of the above operation, as it will be beneficial to preserve as much of the roots as possible. When the plants again are placed in the tan, or the hot-bed, a gentle sprinkling of water should be given them; and from thenceforward they may be treated exactly in the same manner as will be recommended hereafter for plants raised from cuttings.

I shall go on, therefore, to observe, that it would not be prudent to furnish a wall, or any part of a Hot-house, with seedling Vines in their untried state, or before they have produced fruit. For although the prospect of obtaining good kinds from seed sowed in a Hot-house, be more promising and certain than that of getting them from seed of grapes in vine countries, (because there, when the Vines flower, the very air is impregnated with the *farina* of the grapes of the vine-yard, which are, generally, of sorts only esteemed for making wine, but, in a Hot-house, the best-eating grapes are only planted,) yet many of the new kinds from seed will prove to be worse sorts than the originals from which the seed was sowed.

E

A specimen,

A specimen, therefore, of the fruit, should be obtained from each plant, be tried and tasted, before it is permitted to be planted against the walls, or preferred into the Hot-house. Hence you see it will be proper to keep the plants until they are three or four years old, before you dispose of them either on the wall or in the Hot-house; and then, if they be managed as will be hereafter directed, they will produce the fruit you like and approve, and with the greatest certainty.

Having dispatched this new method of raising the Vine from seed, I shall next beg leave to suggest a few hints on the subject of the customary method of propagating this plant, and shall afterwards endeavour to lay down a new and improved method of raising vine plants by cuttings.

The general method of propagating the Vine is, either by layers or cuttings. The Vine is a free-striking plant, therefore young plants may be obtained each way without much difficulty.

When

When the Vine is intended to be propagated by a layer, a shoot that will easily bend to the ground is generally chosen for the purpose. After making the ground light and fine with the spade, the shoot should be fastened by a small hooked stick at about six inches below its surface. If a light fresh soil, with a mixture of pond mud, were well closed about the bottom of the layer, it will facilitate its striking.

The ground should be well closed to the layer; the surface should be made smooth, and formed into a kind of basin, after which a little very rotten dung must be laid therein in the manner of mulching.

The layer will strike freely, either with or without an incision being made at the bottom; early spring, before the rising of the sap, is the most eligible season for the performance of this business, because the shoot would be liable to bleed at the wounded part, as soon as the sap begins to rise.

During summer, if the weather prove dry, frequent waterings should be given, for it is

absolutely necessary to keep the ground in a moist state during that period. The new plant will acquire sufficient roots in the course of the summer, to admit of its being taken off from the mother plant in the autumn, and this should be done as soon as the leaf has fallen. Great care must be taken to preserve the roots of the new plant uninjured through the succeeding winter, therefore it will be proper to keep the plant during that season, in a guarded situation, where it may be well secured and protected from frost, as its future success, in a great measure, depends on the preservation of its first fibres or roots.

Vines are sometimes laid in pots with great advantage. The most eligible method of performing the operation is, by conducting the shoot through the hole at the bottom of the pot, and by making an incision about six inches below the surface.

When a layer is taken from a strong fruitful branch, and laid in a large pot, filled with proper compost, which must be done with great care and caution, it will sometimes

times come immediately into bearing. Indeed, this is the principal advantage that accrues from this mode of practice ; for Vine plants, raised by layers, are much inferior to plants raised by cuttings, both in point of future vigor and durability.

The usual method of propagating the Vine by cuttings, has been in more general practice than that of raising plants by layers ; the cuttings are formed of the lower part of the shoot, consisting of a few joints of the wood of the last year's growth, together with the knot and a small part of the two years old wood. It has been an observation of ancient date, that a vine cutting, when formed complete, has the appearance of a little mallet.

The proper length of the cutting is a point that has not hitherto been perfectly settled and determined.

Miller, whose directions have been pretty much followed, allows it to be about sixteen inches ; others have prescribed shorter dimensions ; but all agree that it should consist

of several joints at least of the last year's wood.

A cutting of this sort will strike freely, either with or without an artificial heat; a temperate hot-bed heat will, however, not only facilitate its striking with greater freedom and vigor, but will also greatly accelerate the growth of the plant.

There seems to be a great superfluity of wood in a cutting of the above description; for when it is deep planted, the lower eyes in general decay; and, if planted shallow, the part above ground commonly dies down to the eye, even with or immediately under the surface.

In this place it will not be improper to observe, that various other plants, as well as the Vine, admit of being propagated by layers and cuttings, and that it is allowed that cuttings are generally preferable to layers, and that plants, raised from small cuttings, commonly make the best plants. The cause seems obvious, viz. that it appears injurious to the new plant, in proportion as it partakes too abundantly of its original or
the

the mother plant. Hence it is evident, that the less the matter that forms the rudiment of the new plant, the better. Indeed this theory is evinced by practice, for it is well known, that those plants raised from seed, which have the smallest beginning, always make better plants, and are greatly preferable to those of the same species, which are raised either by cuttings or layers.

It may be unnecessary here to go through the common process of raising Vine plants by cuttings of the foregoing description, as I propose to offer a more advantageous method of propagating the Vine from only a single eye, and about three inches and an half of the last year's wood. Plants raised by

This mode of propagating the Vine from a single eye first occurred to my very worthy and learned friend the Rev. Mr. Michell, who has been so obliging as to transmit to me the following curious and important account of the success of this method.

SIR,

"I have received two letters from you since I wrote last; the former not requiring any immediate answer, I postponed writing till I could give you a short account

by this method, as I have happily experienced, are greatly preferable to those raised by cuttings in the common way, as they have

known, that those plants which have the smallest beginning, always
 “count of the success of some Vines that were planted
 “cuttings in our way, the end of December, 1775,
 “and beginning of January, 1776, so that they have
 “had only one year’s growth before this spring.
 “One of them, which came to us for the white
 “Sweetwater, but of which I have some doubts
 “whether it may not turn out the white Muscadine,
 “has now no less than sixteen bunches upon it, and
 “I might say seventeen, if I would reckon every
 “thing. The Vine comes out very strong and vi-
 “gorous, and seems able to ripen them all. The
 “uppermost bud has brought out four bunches, the
 “second four bunches, and the third three bunches;
 “and the lowest bunch upon each of these is a full
 “bunch; nor do any of them seem weaker than one
 “might have expected upon a Vine of several years
 “old. Another Vine, which is the Syrian, and
 “was a cutting planted in the bark the 9th of Janu-
 “ary, 1776, has two bunches upon it, one only
 “upon a branch; the bigger of these has its stalk at
 “about half an inch or an inch from the branch, as
 “thick as a moderate goose quill, so that it seems to
 “be providing for a large bunch; but is not expanded
 “far enough yet to form an exact judgment of it,
 “unless to a person who had seen more of it than I
 “have; for I expect it will be a fortnight yet at least
 “before it blossoms. The method of planting
 “cuttings

have more abundant roots, grow shorter jointed, are more prolific, and will, if permitted, come into bearing the second year.

The

“cuttings in the tan, with a single eye to them, is
 “our own. I have never seen nor heard of its being
 “used by any body else, except those to whom my
 “brother and self have recommended it: It may,
 “however, not improbably have occurred to others
 “who may have practised it as well as ourselves.
 “What first suggested it to us to try it, was, that we
 “found cuttings, with two or three eyes to them,
 “planted in the common way, which was the way
 “we first raised them in pots of earth, and plunged
 “into the tan, one eye being left above the earth,
 “were not only troublesome from their great length,
 “but that the eye above ground either dried up en-
 “tirely, or shot weakly at best, and also often died
 “away again afterwards, whilst the buds that were
 “covered with earth got up and thrived much better.
 “This seemed to say, let the bud intended to grow
 “be covered. We also observed, that few or no
 “roots shot from any part but the farthest or lowest
 “extremity of the cutting, so that all the intermedi-
 “ate parts seemed to be of little or no use, provided
 “the roots would shoot equally well from the extre-
 “mity, when shortened to one eye only; and to be
 “satisfied that the joint, immediately below the eye,
 “is desirous of throwing out roots for the use of that
 “eye, one need only look at the roots which are
 “thrown out in several parts of the Vines that are
 “growing

The causes being thus assigned for the preference given to plants raised by this method, and the advantages gained by this mode of practice

“growing vigorously in a Hot-house, which, manifestly, I think, shew that they belong to the eye, or branch proceeding from the eye, immediately next above them. All these together made us think it very likely that the method we now use would succeed, and we had already got into the way of planting the cuttings in the tan first, rather than in pots of earth from the beginning, finding by experience, as well as learning from others, that most things would begin to strike much more readily, as well as more certainly and kindly in that manner, than the other. The cumbersome of a cutting of fifteen or eighteen inches long, that no pot almost will contain, was a thing not to be got rid of. The experiment was easy to try, and no loss if it did not succeed; we therefore made the experiment, and in three or four years, that we have used the method, have found no reason to think that Vines can any way be raised more easily or sooner, or that the Vines raised this way are, in any respect, less vigorous or less productive, either when younger, or as old as we have yet had time to see them, than those raised in any other way; nor do I think that old wood in the cuttings is either necessary or useful, a Hot-house summer, upon plants (that by being planted in the bark, begin to grow a month sooner than the other Hot-house Vines, or even more, if you please) being fully

practice thus specified, I shall now proceed to give directions at large on this subject.

The
 “fully-sufficient abundantly to ripen their wood, if
 “not even almost to over ripen it. And that you
 “might have the means of judging a little better of
 “the merit of this method, I have given you the
 “account, in the beginning of this letter, of two
 “Vines planted in that manner, which, however, I
 “hope to have the pleasure of shewing you some time
 “this year, with the fruit upon them, when you
 “will have a better opportunity of satisfying yourself
 “about it. As to your proposal of planting the
 “cuttings single in pots with sifted tan, I have no
 “doubt but it will do very well; but I doubt whether
 “quite so well as in the bark without pots; for
 “besides that I think the pots prevent the heat, &c.
 “from being quite so kindly, there may so many
 “more cuttings be planted in the bark; and if they
 “are four or five inches only asunder, and are not
 “suffered to grow there too long before they are
 “potted, there is no difficulty in shaking off the bark,
 “so as not to hurt the roots, and they come suffici-
 “ently near together in point of time, their having
 “shot a little, more or less, not being very material;
 “for when they have once begun to shoot, and have
 “got tolerable roots, they will then, as far as I have
 “seen, grow very kindly in pots of earth, whether
 “they are a little more or less advanced.”

Your's, &c.

Thornhill, April 3, 1777.

The first care should be to make choice of proper and well ripened wood to form the cuttings, as it is absurd to imagine that good plants can ever be formed from wood imperfectly ripened: Indeed the case here is exactly similar, and may be considered in the same light, as between plants raised from well-perfected seed, and plants growing from seed not well matured.

Some persons are of opinion, that cuttings taken from the lower part of the Vine are preferable to those that grow higher and at a distance from the root. But for my part, I confess I could never find any difference, so as to induce me to give the preference to either, provided the wood was equally well ripened. But it generally happens that the best wood is produced at the most distant parts from the root, and especially in Vines trained against rafters in the Hot-house, where there is generally a very distinguishable difference between the top and the lower parts of the plants, in respect to goodness.

The new shoots constantly appear first at the most distant parts, and are generally more strong and vigorous, in proportion to their distance

distance from the roots. I mention this particular, because forward shoots from Vines, forced early, are the most eligible for the intended purpose. Early and forward shoots, having a longer summer than those afterwards produced, will, of course, be better ripened and matured.

Vines against common walls, or in vineries, that are not forced early, will sometimes produce remarkably strong wood, and such shoots, on account of their uncommon size, are, by unskilful persons, frequently chosen for cuttings.

The extraordinary size of the shoot I consider as one of the least requisites necessary to form a good cutting. Indeed exceeding strong shoots generally abound too much with pith to claim a preference. I wish to observe too, that much depends on the nature and form of the eye, or bud, as well as the wood, and that better buds are generally produced from shoots of a moderate size, than from exceeding strong ones.

The particulars necessary to form a good cutting are principally these: 1. The eye, or bud,

bud, should be large, prominent, and bold ;
 2. The shoots should be moderately strong, round, and short-jointed ; 3. The texture of the wood should be close, solid, and compact ; but the best criterion of its maturity is, its solidity, and having very little pith^a.

At

^a The young vigorous shoots of many trees, as well as the Vine, greatly abound with pith. Among these the Elder seems to be the most remarkable. I have observed a pith in young vigorous shoots of this plant that has measured above five-eighths of an inch diameter ; and here it may be deemed worthy of observation to remark, that the pith of such shoots decreases in proportion as the wood becomes more mature, and its place occupied and filled with new wood, which shews that wood grows internally as well as externally ; a consideration from hence will enable us to solve a certain phenomenon in forest trees. It is observable that the under branches of the oak and other forest trees are constantly in a state of decay, and especially in neglected woods of large trees where they stand near together. And the custom has been in many places, though a very injudicious one, to cut off those dead branches even with the bole of the tree. But now suppose that a dead branch of three, four, or more inches diameter happens to stand inclining to a perpendicular direction, (which is frequently the case) and this be cut off in the above manner, it generally proves extremely injurious, by causing a material defect : For the bark of the tree soon rises round the base of the stump, and thereby forms

At the pruning season, therefore, make choice of such shoots as come under the above description, cut them to any convenient

forms a kind of basin to receive the falling rain; and thus the remaining dead wood (for the lower part of the branch inclosed in the tree dies also to a considerable depth) is soon brought into a state of decay, which, by being infectious, becomes general, and often terminates in the almost entire destruction of the tree. Let us now conceive a branch of the above description left to nature, and observe the consequence. Her efforts, as in critical cases of the human body, will sometimes perform what the most eminent skill and nicest art cannot accomplish. The upper part of the branch soon decays, and naturally falls off first; one may then really conceive the remaining part to be as a peg or wooden pin, shapen exactly, and fitting and filling up the wounded part for the preservation of the tree. Here it should be understood, for the upper part of this imaginary pin to extend beyond the body of the tree, while its base below is grown over by the annual increase of the bole.

Now the *outside* of the extending part of the dead branch (or imaginary pin) being less mature than the heart or centre, by being exposed to the weather, it will, of course, decay first; and I have constantly observed it generally falls off in annual scales. As these scales shell off, the increasing new bark swells round the base of the stump, and occupies the space till it meets and unites in the centre.—As the new bark covers a considerable part of the dead wood, (for, as has been observed, the lower part of the branch, inclosed in

ent length, and put them into pretty large pots filled with light sandy earth. Let the bottom of each shoot be cut with a sharp knife,

the tree, dies also to a considerable depth, for the decay will follow the grain of the wood) the important subject to be discussed is, whether it may not contribute either to the general decay in the bole of the tree, or cause a material blemish in the wood, when it comes to be converted into use. Now the remaining part of the stump being protected from the weather, and excluded from the air by the surrounding live wood, it may be considered, in a great measure, as similar to the pith of the tree, but with this difference, as having more body, and being of a firmer texture, consequently its decrease will not be so rapid; however, length of time will reduce it to a vegetable mould. This is evident, as these dead stumps are never found entire in the bodies of large, sound, unshaken trees, when converted into use. However, this vegetable mould being devoid either of sand or earthy particles, retains but little body in this state: and being compressed by the *internal growth* (as admitted above) of the surrounding live wood, it will, at the last, terminate in nothing more than a small black knot. I must beg leave to observe, that the dead branches of trees, of the resinous kind, do not come under the above description, for the dead branches of trees, of this class, are preserved by a turpentine matter quite entire, and in their original magnitude. This is evinced by the knots we constantly observe in deal timber. As the preservation of timber is an object of so much importance, I am willing to hope that it will be deemed unnecessary to apologize for this digressional note,

knife, perfectly smooth, as they will then receive the moisture from the mould better than when the wound is rough.

They should not stand too deep in the pot, as the eye below the surface of the mould might receive a material injury during the course of the winter, and thereby be rendered unfit for the intended purpose.

Ten or twelve cuttings may be put into each pot, but they must not stand too near together, as in that case they would be liable to grow mouldy.

When various kinds are intended to be propagated, each sort should be kept in a separate pot, with a label affixed to denote the species.

During the winter, keep the pots in a sheltered situation, and by all means let them be protected from the severity of the season. However, in fine mild weather, though it be in the winter time, the cuttings will be benefited by being permitted to stand awhile in the open air. This exposure will swell, and give a boldness to the bud, and also keep the

wood fresh and continue its vigor ; but great care, nevertheless, must be taken to carry the pots into shelter on the least approach of frost.

The principal care required during the winter season is, to keep the mould in a proper degree of moisture, in order to give the cuttings as much free air as possible ; but at the same time to protect them from frost. The putting the cuttings in pots, and this management of them, is only intended to keep them as fresh as possible till the planting season.

As the cuttings require a hot-bed, and the beginning of March being the proper season for planting them, dung should be previously provided for the purpose. I will not take up the reader's time in going through the common process in the preparation of the dung, and the making of the hot-bed, these operations being generally understood by almost every Gardener ; let it therefore suffice to say, that the bed should be, in all respects, adjusted as if intended for melons, and proportioned in its dimensions to the quantity of plants designed to be raised.

In

In about three weeks after the bed had been made, and its furious fermentation has subsided, take off the frame, and let the bed be well trodden and made smooth; and in such manner that the surface may have an easy declivity to the South. Then replace the frame, and cover the bed about six inches deep with very fine light sandy earth, in which the pots are to be plunged. Tan would answer this purpose, but I prefer a light sandy soil, because (a constant steam naturally rising from the hot-bed) the steam that proceeds from soil is more agreeable and wholesome to the cuttings, than the stench that evaporates from tan.

Watch-sticks should be thrust down into different parts of the bed to ascertain its heat; and then, as soon as the heat becomes moderate, fill a number of the smallest sized pots, (viz. $4\frac{6}{16}$ inches diameter, and $3\frac{8}{16}$ deep, inside measure) in proportion to the number of plants you wish to raise, with very fine light sandy mould. Plunge the pots quite up to their brims into the mould in the frame, and then shut down the glasses till the mould in the pots becomes warm, which done, pre-

pare and plant the cuttings in the following manner.

Now as I have already shewn the properties which constitute a good cutting, I shall here describe the manual operation required in the formation of it.

Let the upper part of the shoot be cut sloping with a sharp knife, about a quarter of an inch above the eye; and at about three inches below the eye, cut off the wood horizontally. Great care, however, should be taken to leave the wood smooth at the bottom; the upper part too should be taken off with a clean stroke. As each joint affords one good cutting, a few shoots of about one foot long will afford you great choice.

The cutting being ready, make a hole with the finger, or by thrusting a small dibble down between the mould and the side of the pot, into which let the cutting be carefully inserted, and so placed, that the eye may admit of being covered about a quarter of an inch deep, with the fine rich mould above described.

It

It is very observable that a cutting strikes with greater freedom against the side of the pot than in the middle of it, for the pot, being porous, imbibes the moisture, and thereby prevents the cutting from being overcharged with it, which is not the case, when a cutting is planted in the middle of the pot.

I always plant the cutting on the North side of the pot, putting a label to denote the species on the opposite side; and whenever the plant is shifted into a larger sized pot, or removed to a different situation, I constantly observe the same rule.—Thus the plant being raised from a single eye, it rises as it were from seed, and the foregoing rule being observed, it will always stand with the same side towards the sun; and by being planted on that side of the pot which stands to the North, it will admit of being kept in the same position when planted out for good; whereas it should be considered, that were it to be planted on the opposite side, (viz. that which stands next the South) the plant must either be reversed in its position when planted out for good, or there would remain the entire breadth of the ball of earth in the
 pot

pot between the wall and the stem of the plant.—Plants in general, but particularly those kept in Hot-houses, or that are intended to be planted against walls, are benefited more by a strict observance of this method, than is commonly imagined. The shoots, leaves, and even the bloom-buds of plants, all form themselves in the most advantageous position to receive as much of the sun's influence as possible.

The sun is the primary cause, the very life and soul of vegetation; and by a certain kind of natural magnetism, plants, in general, have almost as great a propensity to tend to that glorious luminary, as all the various bodies surrounding the earth have, by their gravity, a tendency to its centre.

In the spring, after a dark season, when the sun chances to break forth in a serene evening, it is pleasing to observe small seedling plants, of all kinds, bending with their little faces towards the sun, as if straining and desirous to partake, as much as possible, of his divine influence.

From

From hence it is not difficult to conceive the reason why, on this side of the equator, our plants in general, I speak of those in the open air, should have a certain inclination to the South, and even so as to render their forms (particularly trees) crooked. But it must be considered, that in the summer, when vegetation is in its full career, the sun's rays fall daily almost on every side of plants. Besides the above cause, plants growing in the open air are also greatly agitated by the wind, which, by its variableness, constantly moves them to and from every side; and it is from these two causes in conjunction, that plants grow erect and branch out, as we see they do almost equally on every side.

But now plants in the Hot-house have a far greater propensity to incline to the South, than plants growing in an exposure, because they are not only sheltered from the wind, but are also deprived of light from the North, by the construction of the building.

As soon as the cuttings are planted, give them a very gentle watering, and then put
on

on the glasses. A gentle moderate bottom heat is all that is required, and therefore great attention should be had respecting the heat of the bed. A brisk lively heat, that might agree with many other plants, would be too powerful for the Vine. For the first ten or fifteen days after planting, a great deal of air should be admitted, in the day-time especially, if the weather be clear; and even, should the weather prove mild, a little will be required at night also: It will be prudent, however, to cover the glasses with mats for fear of frost. Should the glasses be kept too close, the buds will rise with too much rapidity, that is, before any roots are formed. I have seen shoots one inch high in the course of a few days; but shoots of such quick progress are very liable to be destroyed by a strong sun; and, therefore, in clear weather, it will be advisable to shade the plants in the middle of the day; and at these times a less quantity of air should be admitted.

Give the plants a gentle sprinkling with water every four or five days in fine weather; but should it prove dark and moist, once in eight or ten days will be sufficient. Observe always to water in an evening, just when the sun

fun is going off the plants, and let the glasses be shut down close in the nights after watering: This will cause a moisture to be raised in the bed, which the plants will imbibe to their great benefit.

As the plants increase in size, constant waterings should be given, and a greater quantity of air admitted in proportion to their progress: By the time they get to be six or eight inches high, they will require to be shifted into pots of a larger size. Great care, however, should be taken in the performance of this operation, neither to injure the top nor roots of the plant. The plant should be turned out of the pot with the roots and ball entire, and the pot should be sufficiently large to admit of a proper quantity of fresh earth on this shifting. I generally put the plants into pots of seven inches diameter, by six deep, (inside measure.) If the heat of the bed begins to abate, it should be renewed with a little fresh stable-yard dung, and the frames should be raised to a proper height, in proportion to the progress of the plants.

In

In replacing the plants in the bed, regard should be had to setting them in the same position they were in before, for the reason already given.

Small sticks should be provided to support the shoots when they are grown to the length of ten or twelve inches. Pinch off the wires or tendrils, and also the lateral shoots, as they are produced. Keep the pots clean from weeds, and give the plants frequent and gentle waterings; but this must be adjusted according to the state of the atmosphere, since, in moist weather, the humidity of the air, in a great measure, answers the purpose of watering.—Give plenty of air at all times, but especially in a fine day, when, if there be not much wind, the glasses should be entirely taken off. If the glasses be kept too close, the want of a sufficiency of free air will cause the plants to grow tall and long-jointed: And it is for the same reason, that the plants ought not to make too rapid a progress in the fore part of the summer, it being far more desirable that they should grow robust and strong, which they are more likely to do with a gentle bottom heat, and

and when a sufficient quantity of free air is admitted.

If the weather should prove favourable at the end of May or beginning of June, the plants will require as much free air as possible; and, therefore, the covering should be entirely omitted, except when there may be an appearance of frost at night; and even then, the glasses should not be shut down close.

Should any of the plants appear weak and unpromising at this season, viz. about the middle of June, I generally cut them down to the lowermost eye; and then they will, by the assistance of a hot-bed, strike freely and rapidly, and produce strong, straight, and vigorous shoots; and, by proper care and attention, the wood may be brought to a tolerable degree of perfection even after this season.

In places where a Hot-house, or Vine-wall and border, have been previously provided, and are in readiness for the plants, it would be advisable to plant the Vines out for good, about the end of June, or beginning of July,

as

as they will make a good progress after this season in the same year. But in new works, it is almost impossible to get the building and border ready to receive the plants the first summer, as the border will require a competent time to be worked over, to meliorate, and to settle; therefore my directions will, principally, relate to such plants as are kept in pots through the first winter. I the more strongly recommend this mode of practice on another account, which is, that as so much depends on the preservation of the first roots, the plants can be better preserved in pots, which may be set in a green-house, &c. in the winter, than when planted in the open ground, where they will be exposed to the severity of the weather.

In the months of July and August the young plants will require very little artificial heat. I have sometimes placed them against a common wall during those months, and have found the plants succeed very well. They will, however, by the assistance of the bottom heat, grow faster; and by being kept in a Hot-house, they will make still a greater progress. I have sometimes had plants which have made shoots upwards of

twenty

twenty feet long in the first summer. But when plants are intended to be kept in pots through the winter, a moderate-sized plant is preferable; because in large plants, (and such as are kept many years in pots) their roots will be too much bound together and matted. A plant with a shoot of about five or six feet in length, moderately strong, and perfectly well ripened, is quite sufficient.

I generally stop the plants (by pinching off their tops) at that length; for, if intended for a vinery, they will require to be cut down within a few inches of the ground; and, if for taking through the front wall, and training in such Hot-house as is here recommended, about three feet is a sufficient length. But when plants are wanted for any purpose where a longer stem is required, they must be trained accordingly. In all cases, however, it should be remembered, that four or five eyes at the top of the shoot generally break out into laterals, and thereby render that part of the wood useless, so that a proportionable allowance should be made in consideration of this defect.

The

The pots should be constantly kept clean from weeds, and, during the hot months, very frequent waterings should be given to the plants. In very hot dry weather they will require a little water twice a day.—I constantly cover the surface of the mould in the pots with a little rotten cow's dung. This mulshing prevents the mould in the pots from drying too fast, and also contributes to invigorate the plants.

When Vine-plants have been trained up either against a common wall, reed-hedge, &c. (where they will succeed very well during the hot months, especially in a sheltered situation, and particularly with the assistance of a bottom heat) it will be proper to bring them into a Hot-house about the beginning of September; because if permitted to stand in the open air, they generally lose their leaves on the first autumnal frost; and after this the wood cannot attain to a proper degree of maturation; whereas, in the Hot-house, they will constantly retain their leaves till the beginning of December; and, when this is the case, the wood will generally be in the highest degree of perfection.

About

About the middle of December the plants should be pruned down to the proper lengths required ; if intended to take through the front wall of an Hot-house, three feet and a half is a sufficient length ; but if intended to plant in a vinery, they should be cut down to eight or nine inches.

Towards the latter end of December, it will be necessary to remove the plants into a green-house, glass case frame, &c, in which cool situation they must remain till the middle or towards the latter end of February ; when, if the season proves tolerably favourable, they should be planted out for good.

During the time the plants stand in this cool situation, they should be watered very sparingly ; a little water given every ten or twelve days, just to keep the mould in the pots moderately moist, will be quite sufficient. Give plenty of air in mild weather, and especially towards the latter part of the time ; for if the plants are kept too close and warm, they will be liable to shoot too early, in which case they should be planted directly, that is, as soon as the eyes appear in motion, for the plants would be greatly injured by
being

being retarded in their progress after this period.

I will now suppose the Hot-house to have been built the preceding summer, and the border previously prepared, according to the foregoing directions; in which case, if the weather will permit, the Vines should be planted about the latter end of February, or beginning of March, in the front of the Hot-house, in the following manner. As the eyes of the Vine-plants are liable to be injured by being taken through the holes of the front wall, some method should be adopted by way of prevention. I generally put a little moss round the upper part of the stem of the plant, and over this wrap two or three thick folds of paper, which I tie round with the strands of bask matting.

Opposite to each rafter, and close to the front wall, make holes of about two feet diameter, and one foot deep; let the mould taken out of the holes be made fine; and if a little fine compost mould, of a very rich quality, be added thereto, it will facilitate the growth of the plant. Turn the Vine-plant very carefully out of the pot, and put the upper part
 I of

of the stem through one of the holes of the front wall. If the shoot will just reach the bottom of the rafter, when planted, it will be sufficient. But as the mould put into the hole, and the border itself too, may yet settle a little, an allowance of two or three inches should be made for the settling of the plant also.

Observe to set the plant with its proper side to the sun; then, while one person holds the ball in the exact place in which it is designed to stand, let another put mould carefully under and round every side thereof. In closing the mould to the ball, care should be taken to preserve the roots of the plant. The extreme points of the fibres being exceedingly brittle, are very subject to be injured unless great care be taken in the performance of this operation. Raise the mould about one inch above the top of the ball, and form the surface into a kind of semicircular basin, in which it will be expedient to lay a thin mulching of rotten dung, and to give a gentle watering to settle the whole. Then take off the moss, paper, &c. and let the top of the shoot be carefully fastened

to the rafter. Thus the business is completed.

To direct the very identical kinds of Vines to be planted, may, perhaps, be deemed an act of officiousness, since every one, who is at the expence of an Hot-house, has an undoubted right to consult his own palate; and more especially, as I have, in a former part of this work, pointed out the kinds most proper for training in a pine-stove: I shall, however, just beg leave to observe, that the more vigorous-growing kinds ought not to stand next each other; and that, if the different species of black, white, blue, grizzly, red, and amber were judiciously mixed, they would have a much better effect in regard to beauty and appearance, than when two or more of the same colour are planted together*.

The

* Mr. Carter, in his "Journey from Gibraltar to Malaga," gives the following superb account:—"This hill is so full of verdure, that the village, as well as the roads about it, are, in a literal sense, covered, shaded, and crowned with all manner of fruit-trees of a prodigious size ;

The Vines, in general, will begin to shoot immediately after they are brought into the Hot-house: Only one shoot should be permitted to remain on each plant; but for fear of an accident, (for young shoots easily break off from the old wood) it will be advisable to let two remain, till they are grown to a sufficient length to be fastened to the rafters. When one shoot is secure, the other may be taken off, but not close to the old wood, as it would occasion it to bleed, and thereby greatly injure the Vine.

From the time the Vines begin to grow, they will require constant watering, especially in dry weather, and more particularly in the beginning of the season before the roots penetrate deep into the border.

Let a shoot be trained up to each rafter; when the rafter is of a competent depth, and

G 2

bevelled

size; to whose topmost branches the luxuriant Vine mounts vigorously and hangs in over-grown clusters, numberless bunches of red, black, and green grapes, which frequently intermixed with the golden-apple, the Pomgrate, and the Orange, expose a most enchanting picture to the charmed eye." p. 7.

bevelled off nearly to an angular point on the under-side, the shoot should be fastened thereto; but when the rafters are not of a sufficient depth to keep the leaves of the Vine from touching the glass, the best expedient is, to fix iron pins, of about nine inches in length, at proper distances under each rafter. There should be a small hole, or eye at the bottom of these pins, through which a small iron rod, or strong wire, should be fixed, for the support of the branch. The pins and wires should be painted as soon as the work is finished, as the moisture, which arises in the Hot-house, would instantly cause them to rust and decay.

It is not unusual for Vine-plants, raised in the manner here directed, to shew fruit at one year old. I have often had plants that have borne many bunches at that age, and have sometimes permitted three or four of them to remain on the plant, and they have been brought to a tolerable degree of perfection; and that too, even when the plant has grown in a pot not more than one foot diameter. But when Vines are planted with an intent to furnish the roof of an Hot-house, they should not be allowed to produce fruit

fruit the first season, as it would tend to debilitate the plant, and prevent its progress in growth: However, when a person is desirous of proving the kinds, one bunch, with the berries well thinned, may be suffered to remain, without much injury to the plant.

During the summer, if the Vines meet with no impediment or disaster, they will make a good progress. Observe, however, to water their roots constantly; and, as their shoots make advances, keep them regularly fastened to the rafters: Divest them also of their wires, and also of their laterals whenever they appear: But, above all, guard well against insects, particularly the *Acarus*, or red Spider: The rapid, though insensible depredations sometimes committed by these minute intruders, are really astonishing: But I shall have occasion to speak more fully on this head in another place.

The Vines may be permitted to run two thirds of the length of the rafters, or, in general, about twenty or twenty-five feet, before they are stopped: And those, that grow remarkably strong, may be suffered to run

run the whole length of the rafters, or about thirty feet.

When the Vines were planted in the large Hot-house at Welbeck, in 1779, I permitted, by way of curiosity, a remarkably vigorous-growing plant of the white Muscat of Alexandria, to make a random progress after it had got to the top of the rafter. It was trained sideways along the top of the stove. It continued to grow till late in the month of November, when, on taking the measurement of the shoot, I found it forty-six feet seven inches in length^p. In December it was

^p The following account of the surprising progress of some Vines, last summer, at Kelmarsh in Northamptonshire, addressed to me by William Hanbury, Esq; will, I trust, prove highly acceptable to my readers :

“ Agreeably to your request, I herewith transmit you an
 “ account of the progress of the Vines I had from
 “ you in November, 1786. The surprising shoots
 “ they have made in one season, have astonished every
 “ one who has seen them.

“ You sent them in balls of earth. The plants
 “ were small, the shoots not thicker than a goose
 “ quill, and raised, as you said, from single eyes the
 “ preceding spring. They were immediately put into
 “ pots

was pruned down to twenty-two feet, (or about thirty-five eyes) and the next summer produced two or three bunches at almost every eye. I did not, however, permit more than ten bunches to remain, which, in general,

“pots about ten inches diameter. Their future management was nearly as follows :

“The pots were put into the Hot-house, and the plants were cut down to the lowermost eye in each. The soil a fresh sandy loam, mixed with about one third of rotten stable-yard dung.

“The Vines were constantly kept in a moist state ; and, from November to March, were watered with rain-water only ; but from March to June, we often watered them with soap suds.

“During the time the Vines were in the Hot-house, they were kept perfectly clean, and free from insects : Only one shoot was permitted to grow from each plant.

“The last week in June the Vines were taken carefully out of the pots, and planted in a border on the South side of the Hot-house, with their balls entire. The shoots were conveyed through holes in the front wall, and trained upwards against the rafters which support the roof of the Hot-house.

“I should have observed, that the border is composed of the same materials as has been described for the pots, its depth five feet, and its breadth fourteen feet : Also, that the Vine-shoots were, in length,

general, were brought to a great degree of perfection, but not any way superior to those produced on strong plants, that had been stopped the preceding summer at twenty or twenty-five feet.

After

"at the time when planted, from ten to fourteen feet.

"During summer the border was kept in a moist state, by watering it some times with rain water, and sometimes with soap suds.

"Many of the Vines showed fruit; but, according to your directions they were divested of all the bunches except one, which was permitted to remain on a Vine, which you called the white Muscat of Alexandria. This bunch was cut on the 26th of November last, and weighed three pounds wanting only two ounces. The berries were, in general, very large, and of an excellent flavour.

"The Vines are, at this time, remarkably strong; and, in consideration of their different characters and qualities, I may say have grown with an almost equal degree of vigour.

"I have measured the length and girth of each Vine-shoot, (there being thirteen in number) and find them, in length, from thirty-one to forty-eight feet, and in girth, from one-inch and a half to two inches."

I am, &c.

Kelmarsh, Dec. 14, 1787.

After the Vine-shoots are stopped, (which is done by pinching off their tops) they will, in general, push out laterals at three or four eyes on the upper part of the shoot. These laterals should not entirely be taken off, as it would cause more eyes lower upon the shoot to push also. It would, therefore, be prudent to permit the first laterals to grow twelve or fourteen inches, and then to pinch off their tops. These laterals, in their turn, will push out secondary laterals, which should be pinched off at the second or third joint: Thus the sap may be diverted till the end of the season.

In November, and the beginning of December, the leaves of the Vines change from green to beautiful variegated colours, and soon after fall off.

The time when the leaves of the Vine begin to fall, is the best season for pruning. In the Hot-house, this will generally be in the month of December. In the first season of pruning, supposing the Vines to have grown with an exactly equal degree of vigour, it will be proper to prune the shoots at every other rafter down to three, four, or five

five eyes, and the other to about twenty-one or twenty-two feet. Here I wish to be understood, that the above mode of pruning is only to be used when Vines have grown remarkably strong the preceding summer; for when Vines have grown only moderately strong, the shoots should be pruned down to about half the above length, viz. eleven feet.

The intent in this alternate difference in pruning is, that the former should make fine wood for the succeeding season, and that the latter should produce a crop of fruit, (after which, these fruit-bearing shoots must all be cut down nearly to the bottom of the rafters); but when any of the Vine-plants appear weak, and have not made shoots more than eight, ten, or twelve feet long, it will be proper to prune every such shoot down to two, three, or four eyes, without having regard to the afore said direction of furnishing every other rafter with a fruit-bearing shoot.

In pruning, observe to take off the shoots with a clean sloping stroke, about half an inch above the eye. Make choice of a bold eye to terminate the end of the shoot. After
pruning,

pruning, let the Vine-shoots be completely fastened to the rafters, &c. and thus ends the business for the first season after planting.

Vines growing in pine-stoves constantly begin to shoot early in the month of January; at that season they generally make weak shoots, and shew small bunches; and this proceeds from the house being kept warm at that season, on account of the early crops of cucumbers, kidney-beans, &c. which are raised in most Hot-houses. But when a Hot-house is kept to a proper degree of heat required for pines, during the winter months, the Vines will seldom begin to push till about the middle of February. It is usual to see Vines in pine-stoves push only at two or three eyes at the extremity of the shoots. These two or three new shoots taking the lead, the rest of the eyes below will remain in a dormant state, and cause a long space of naked wood. In order to make the eyes push more generally, it will be proper, as soon as the sap appears in motion, to keep the house, for a short time, a few degrees warmer than usual, viz. in the morning the Thermometer should be five or six

six degrees above temperate, and in the day-time the house should be kept as warm as the weather will permit: It will also be necessary to guard that part of the stem of each Vine, which is on the out-side of the house, against the approach of frost, as one severe night would greatly injure, if not totally destroy, the hopes of the crop.

As soon as the sap rises, its motion is exceedingly rapid; and, if part of the stem be exposed to the external air, a severe frost would entirely stop its circulation. The young shoots and leaves instantly contract, and, during the frost, appear in a shrivelled state; to prevent which, let the part exposed be well guarded by wrapping it round with moss, fastened by strands of bafs matting, to a competent thickness. This covering should be permitted to remain till the spring frosts are entirely over; and, when this covering is taken off, let the stem of the plant be made clean by well washing.

When Vines break out freely, they will push at almost every eye, from the top to the bottom of the shoots, nearly at the same time, and the shoots in general will shew

two or three bunches each. It will be proper, however, to divest the Vines of their supernumerary shoots, as soon as can be done with propriety, as it will greatly contribute to invigorate the remaining shoots.

It is very easy to distinguish which will make the most promising shoots, even as soon as the eyes begin to break; and by the time the shoots begin to be three or four inches long, the bunches are very distinguishable. In some kinds, the rudiment of the bunches stand so prominent as to be very visible, even at the breaking of the eye.

The leaves of the young shoots generally stand single at the first, second, third, and, in some kinds, at the fourth and fifth joints, and afterwards form in pairs, either with bunches or tendrils. And what is very remarkable, and differs from the ordinary course of nature in other sorts of fruit, is, that the bunch is produced from the side of the shoot opposite to the leaf, and comes out from the naked part thereof, being neither connected with the leaf, nor the eye, nor the rudiment of either. The bunches appear at the third, fourth, fifth, and sixth joints;

joints ; from the sixth forward, the leaves form in pairs with the tendrils. When Vines have been very vigorous, and exceedingly prolific, I have sometimes seen bunches at the seventh, eighth, and once at the ninth joint ; but an instance of this last is very rare.

When Vines shew bunches plentifully, it often induces the person intrusted with their management to leave too abundant a crop ; but this temptation should be withstood, as a few bunches in an high state of perfection, are preferable to numbers in a less : Besides, the future success of the Vines depends much on a judicious management in this particular : Therefore, in case the shoots, which are pruned to about twenty-two feet, should shew two or three bunches at almost every eye, which they will frequently do, not more than nine or ten of the young shoots should be permitted to stand, viz. the leading or top shoot, and four or five on each side ; and the shoots that remain should be divested of all but one bunch on each, which should be the bunch which is best proportioned and most regularly formed. The shoots should be left at regular distances, that is, about
four

four or five feet apart on each side: Observe also to let one shoot as near the bottom as it can be got. These shoots should be trained regularly on each side of the rafter, and the top of each shoot should be pinched off as soon as they are grown to a sufficient length, and begin to interfere with the adjoining shoots above; or, in general, let the shoots be stopped at the second or third joint above the bunch.

Great attention will be required during the time the Vines are in flower. Should the weather prove hot and dry, and accompanied with brisk winds at that critical period, the berries of many kinds of grapes (particularly the blue Frontinac, white Sweetwater, and black Damascus) will be liable to fall off at the time of their setting, and the berries that remain will, in general, be very small, and without stones. This proceeds from the calyx adhering to, and drying upon, the germen or rudiment of the berry, and thereby preventing its impregnation. Therefore, in order to have the crop set permanent, it will be proper at this period to water the roots of the vine plentifully, to keep the house as close as the weather will permit, and

and to water the walks and flues in the Hot-house constantly, and especially late in the evening, when the glasses should be immediately closed. The heat of the Hot-house will exhale the moisture, and raise a kind of artificial dew, which, by falling upon the calyx, will cause it to expand and fall off. By this means, the important parts of fructification are set at liberty to perform the offices for which nature intended them, viz. the increase and propagation of their species. After a kind impregnation, the berries always swell very fast.

It is not unusual to see bunches of the white Sweetwater, and some other kinds of grapes, greatly abound with small berries, (which are without stones) which proceeds from the above recited cause, and may be prevented by an assiduous attention to the foregoing rules.

Although grapes set best in a close moist air, yet the Hot-house should not be violently hot during the time of their setting.

When the weather is serene, and all circumstances concur agreeably, transparent
drops

drops of dew will be observable in a morning on the angular points of the Vine leaves.

This is the most favourable indication which can happen at the critical season of the Vine's flowering; for I have constantly observed the grapes to set well, and the growth of the berries to have been extremely rapid, when the Vines have been in this state.

Pull off the superfluous shoots which may break out in various parts of the old wood during the summer, and dress the young shoots of all their laterals likewise, whenever they appear. This may be done without reserve, or having the least regard to the preservation of the wood; because every Vine-shoot that was left more than twenty feet long at the last year's pruning, with intent to produce a crop of fruit, must be cut down nearly to the bottom at the next winter's pruning.

But all the rest of the Vines, that were cut down at the last year's pruning, I will suppose one at every other rafter, must be
H trained

114. ON THE MANAGEMENT

trained with one shoot each, exactly the same in every respect as in the preceding season.

When grapes are at the last swelling¹, and till they are nearly on the point of being ripe, the Vines will require a plentiful supply of water, and especially if the season should prove hot and dry. Few plants perspire so abundantly as the Vine, and more particularly when it is under glasses. The situation of Vines, trained in pine-stoves, may be considered exactly in a similar state with Vines growing in very hot climates. Near the tropics, for instance, we are told that at the Madeiras they do not attempt to plant vineyards, even where both soil and situation are the most desirable, without a command of water¹, the Vines there requiring a constant supply

¹ The last swelling of grapes commences at the time they begin to be transparent. At this period, the red, black, &c. grapes begin to change from green to red, black, &c. respectively.

² "The great produce of Madeira is the wine, from which it has required fame and support. Where the soil, exposure, and supply of water will admit of it, the Vine is cultivated. The inclosures of the vineyards consist of walls,

supply of that element, and especially at the time they are loaded with fruit.

H 2

If

walls, and hedges of prickly pear, pomegranates, myrtles, brambles, and wild roses. Walks of about five or six feet wide intersect each vineyard, and are included by stone walls two feet high. Along these walks, which are arched over with laths about seven feet high, they erect wooden pillars at regular distances, to support a lattice-work of bamboos, (a sort of cane) which slopes down from both sides of the walk, till it is only a foot and a half or two feet high, in which elevation it extends over the whole vineyard. The Vines are, in this manner, supported from the ground, and the people have room to root out the weeds which spring up between them. In the season of the vintage they creep under this lattice-work, cut off the grapes, and put them into baskets: Some bunches of these grapes I saw, which weighed six pounds and upwards. This method of keeping the ground clean and moist, and ripening the grapes in the shade, contributes to give the Madeira wines that excellent flavour and body for which they are remarkable.

"The water is conducted by weirs and channels into the vineyards, where each proprietor has the use of it for a certain time; some being allowed to keep a constant supply of it, some to use it thrice, others twice, and others only once a week. As the heat of the climate renders this supply of water to the vineyards absolutely necessary, it is not without great expence that a new vineyard can be planted;

If the foregoing directions have been strictly attended to, the bunches of grapes will,

planted; for the maintenance of which, the owners must purchase water at a high price."

Forster's account of Cook's voyage, vol. ii page 23.

A frequent supply of water is not only profitable to the Vine, but also equally beneficial to other kinds of fruit-trees growing in warm climates, as is evinced by the following extract from Sir William Hamilton's elegant account of the late earthquakes in Italy, communicated to the Royal Society in the year 1783.

"From this place* to Reggio the road on each side is covered with villas and orange-groves. I saw not one house levelled to the ground; but perceived that all had been damaged and were abandoned; and that the inhabitants were universally retired to barracks in these beautiful groves of orange, mulberry, and fig-trees, of which there are many in the environs of Reggio. One that I visited, and which is reckoned the richest in all this part of *Magna Grecia*, is about a mile and a half from the town of Reggio; and, what is remarkable, belongs to a Gentleman whose name is Agamemnon. The beauty of the Argrume (the general name of all kind of orange, lemon, cedrate, and bergamot trees) is not to be described; the soil being sandy, the exposition warm, and *command of water*, a clear rivulet being introduced at pleasure in little channels to the foot of each tree, is the reason of the wonderful luxu-

riancy

* *Torre del Pezzolo.*

will, in general, be large and fair, with well-fwelled and high-flavoured berries.

After

riancy of these trees." To which I shall only add, that every body knows the vast use of canals in the cultivation of fruit-trees, in the land of Egypt, at this day. "Don Agamemnon assured me it was a bad year when he did not gather from his garden (which is of no great extent) 170,000 lemons, 200,000 oranges, (which I found as excellent as those of Malta) and bergamots enough to produce 200 quarts of the essence from their rinds. There is another singularity in these gardens, as I was assured, every fig-tree affords two crops of fruit annually; the first in June, the second in August.

"Silk and essence of bergamot, oranges, lemons, are the great articles of trade at Reggio. I am assured that no less than 100,000 quarts of this essence is annually exported. This fruit, after the rind is taken off, is given to the cows and oxen; and the inhabitants of this town assure me, that the beef, at that season, has a strong and disagreeable flavour of bergamot."

I shall beg leave to make two observations on the foregoing accounts:

First, I presume that water is not admitted either into the orchards or vine-yards during the winter, as a wet soil would prove highly injurious to those kinds of fruit-trees at that season. It is, on this account, I have directed drains

After the fruit is cut, the Vines will require no other management till the pruning season, but taking off their laterals, in the manner

drains for the purpose of taking off the superfluous water at the bottom of the Vine-border;

And secondly, as too much water at the time of the ripening the fruit would debase its flavour, I conclude, that if Sir William Hamilton and Mr. Forster had made inquiry, they would have been informed by the respective inhabitants, that the waterings are less frequent at the time of gathering the fruit and the season of the vintage, than at an earlier period.

Since the foregoing notes were written, I have met with the following curious account, which shews the necessity and great importance of a plentiful supply of water in vineyards, &c. in warm climates.

“Water is the great agent, the *primum mobile* of all productions in this country; every thing languishes, and soon is parched up, without an ample supply of it; abundance of rain secures both a plentiful harvest and a copious vintage.

“Whenever a spring breaks out, the King’s people seize upon it, and allot to each landlord a proper hour for letting the water upon his grounds. It is of so much consequence, that the value of a guinea has been paid for an hour extraordinary.”

Swinburne’s Travels through Spain, page 113.

manner already pointed out for the preceding year.

At the next winter's pruning, all the Vines that produced a full crop of fruit should be cut down nearly to the bottom,
that

As it frequently becomes necessary to convey ripe grapes to a remote distance, and as this delicate fruit is very liable to receive injury by improper methods of packing, I hope the following information on this subject may be of use to many of my readers.

When grapes are intended to be conveyed by water, they may safely be packed in boxes with sand. First, put a quantity of sand sufficient to cover the bottom of the box about one inch; upon this lay your bunches in a course, or layer, almost close together, only take care that none of the berries touch the sides of the box. Upon this layer of bunches pour in dry sand, till the grapes are covered about half an inch; then lay in more grapes and sand alternately, till the box is filled.

Grapes thus packed will travel safe, and by being almost excluded from the air, will keep fresh and good a long time. Grapes are constantly thus brought into this country from *Portugal*, and they often arrive in pretty good perfection. But now considering the expence from weight in this mode of packing, it would be extravagant to use it when this fruit requires to be sent a considerable distance by land carriage.

Grapes

that is, to the lowermost summer shoot, which shoot also should be cut down to the first or second eye.

But all those Vines, that were cut down nearly to the bottom the preceding season, and

Grapes will also travel with great safety, by being packed in a box with any small bright seed. Clover seed is very proper for this purpose; but the expence attending this mode of conveyance is also very considerable, both on account of the great value of the seed, and also in respect of its weight. I would therefore recommend the packing grapes in oat-chaff, as the most eligible in all respects.

Grapes have sometimes been packed in tow, wool, cotton and paper shavings; but I find, by experience, that oat-chaff is greatly preferable. Oat-chaff is not only exceedingly light in its nature, but is also possessed of a kind of elastic force.

Please to observe, that when oat-chaff is used, it ought not to have any disagreeable smell; it should also be cleansed of all impure matter; and the grapes should be perfectly dry at the time of packing, and the bunches well examined, that if there be any berries either decayed, cracked, or bruised, they may be clipped off the bunch.—Then carefully tie each bunch in a bag made of silver or gauze-paper, its size being proportioned to that of the bunch.

In

and which will, in general, have made very strong wood, must be left to the length of twenty-one or twenty-two feet each, with intent to produce a full crop of fruit the following season.

The

In packing proceed thus : First put a good quantity of chaff into the box, then carefully lay your grapes in a kind of course, or layer ; a small quantity of chaff should be lightly pressed between each bunch, as also between the bunches and the sides of the box.—Then add more chaff, press it lightly, and lay in a second course, or layer of bunches : Grapes, however, packed in this manner, ought not to be more than two courses deep, because the bottom bunches would be liable to be injured by the weight above.

I must observe, that the course of chaff between the layers of the bunches, and likewise at the top and the bottom, ought, when it is well pressed down, to occupy a space of about two or three inches.

I have for many years thus sent grapes from Welbeck to London, (a distance of about 150 miles) and when the boxes have been put either in the inside, or upon the body of the coach, the grapes have generally gone without injury, and even preserved their bloom : Nor do they require dipping in water, which is a necessary operation when grapes are sent in sand. However, I must say, that when boxes go in the coach boot, (where the motion is more violent) the fruit will commonly spoil ; for which reason, I have boxes made exactly to suit the seats of the stage coaches.

The management of the Vines the next summer, will, in many instances, be nearly the same as in the preceding one. Only let it be considered, that as the Vines have increased in strength and size, they will, consequently, be enabled to produce and support a larger burthen of fruit.

The crop should, at all times, be proportioned to the size and vigour of the tree, and that in every stage; but especially while the Vines are young, it will be advisable to use great moderation as to the number of bunches which are to be allowed to go on to maturity.

The shoots may now be laid rather closer together than in the preceding season, and two bunches may be permitted to remain upon such shoots as are strong and vigorous; and especially, of those kinds that do not produce large bunches. It will be proper, however, that the berries of the bunches, in general, should be well thinned*. This work

* In order to thin grapes with propriety, a proper pair of scissars should be provided. The blades should be made with

work is best performed at the time when the berries are about the size of small shot. Great address is required in the performance of this operation ; and particularly when the bunches are extremely large. The first thing to be done is, to extend both the main shoulders, as also the less projecting parts of the bunch, which parts should be suspended by small strings, and fastened to the rafters, or glass-case frames above. Every projecting part of the bunch should be raised to an horizontal position ; and, when the berries are fully swelled, they will retain that position even after the strings are cut.

In thinning of the berries, great care should be taken to leave all the most projecting ones on every side of the bunch ; since by this means the dimensions of the bunch will not be diminished.

In those kinds of grapes that produce very close-growing bunches, it will be necessary

with exceeding sharp points, and not more than one inch and a half long : The shanks about four inches long and quite straight : The eyes sufficiently large to contain a man's thumb and two fingers.

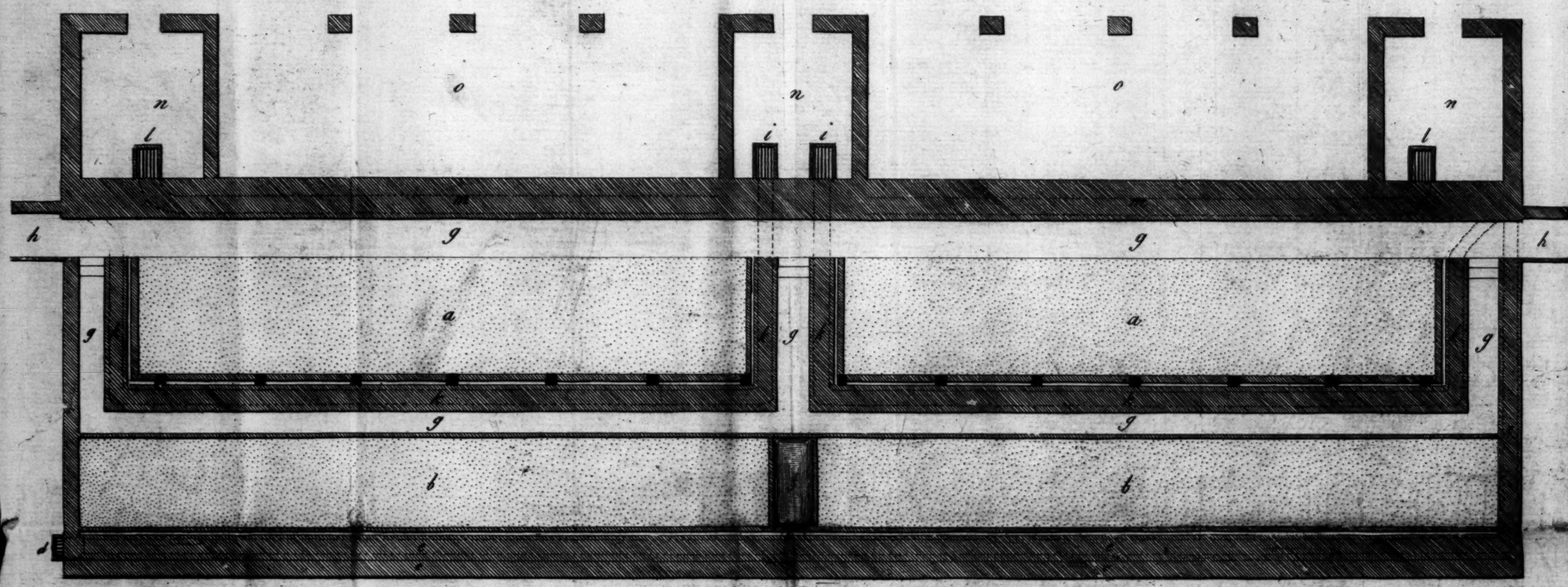
cessary to clip out more than two-thirds of the berries ; but in some kinds, one-half ; and, in the loose growing kinds, with long foot-stalks, the taking out one-third is generally sufficient.

By this mode of thinning, the remaining berries will, in general, swell well, and grow to a very great size, and will not be subject to rot, as is generally the case with grapes in a Hot-house, when the berries are permitted to grow close, and to become wedged together.

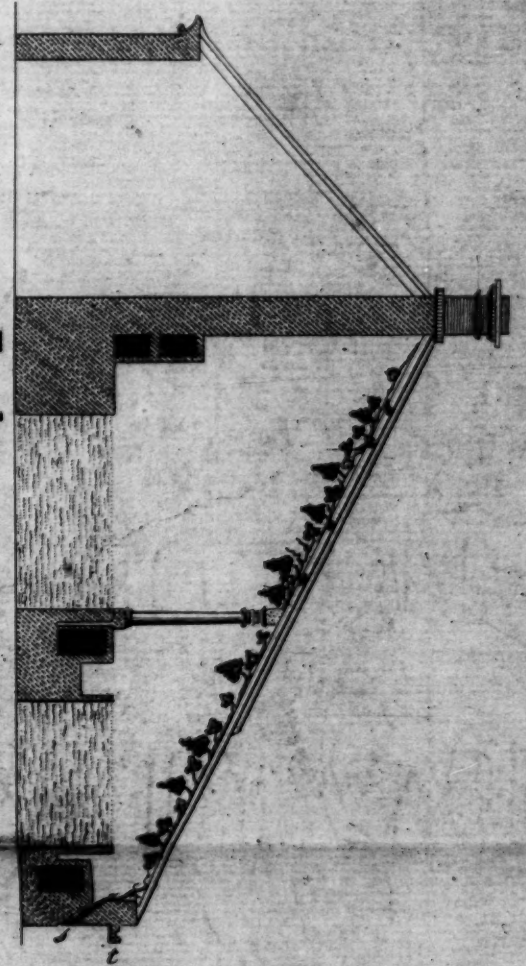
In training the shoots of the Vines, I have hitherto taken notice only of furnishing the rafters, or roof, of the Hot-house ; but there is yet another important object that demands our consideration, which is, a further advantage that may be gained by furnishing the back wall. In such Hot-house, as the subjoined plan represents, there is a space of nine feet clear above the flue in the back wall ; the length of the said wall being (nearly) one hundred feet, there is, of course, a space containing almost nine hundred square feet, and certainly there is no part of a Hot-house that can be rendered useful,

A PLAN of an approved *PINE* and *GRAPE* STOVE

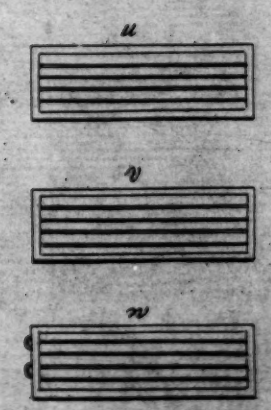
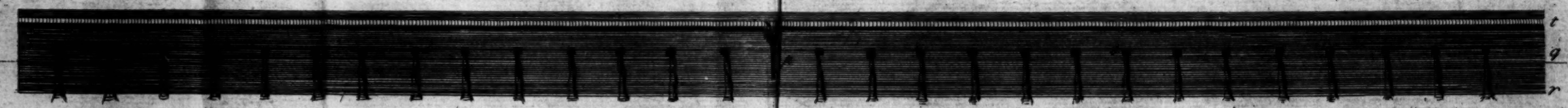
Ground Plan



Section



Elevation of the Front Wall



10 20 30 40 50 Feet

useful, which should remain unoccupied. A space, therefore, so considerable as the above, undoubtedly merits our attention.

Now, in order to furnish the back wall, let every fourth or fifth Vine-plant be trained in one shoot quite to the top of the rafter; then direct the shoot sideway ten or twelve feet along the top of the back wall. At the winter's pruning, bring down that part of the shoot perpendicularly, which, in the preceding season, was trained sideway, and cut it off at one foot above the top of the flue. The next spring, encourage only two shoots from the two extreme or lowermost eyes of each shoot so brought down, and train them in an horizontal direction one foot above the top of the flue. These shoots will, however, grow with greater readiness, if they be trained upwards during the summer; and in such case they may easily be brought to the desired position at the next winter's pruning. When the pruning is finished, and the shoots brought down and fastened in their proper position, they will form against the back wall the following figure *L*, viz. the figure of the letter *T* reversed.

L

In

In the next season, the horizontal shoots will produce new wood from almost every eye, provided all the shoots be pinched off from every other part of these plants as soon as they appear. Lay in the young wood at proper distances, that is, the shoots from one to two feet apart, according to the kind of Vine to be trained, whether it produces small or large leaves : But of this I shall have occasion to treat more particularly hereafter.

The shoots must all be trained in a perpendicular direction ; and provided they are strong and vigorous, may be permitted to grow to the length of five or six feet before they are stopped ; but these shoots must all be cut down to two or three eyes at the next winter's pruning.

Only one shoot should be permitted to rise from each spur the following season ; and although they will in general, be sufficiently strong, and produce two or three bunches apiece, yet only one bunch should be suffered to remain upon each shoot : The remaining bunches will then be large and fine, and the wood also will be greatly benefited by this mode of practice.

These

These shoots must be pruned next winter very differently from the preceding. One shoot must be left four feet, that next it only a few inches long, and so on alternately, throughout the whole length of the wall. The reason for this alternate difference in pruning, and for the continuation of the future management of the Vines growing against the back wall, will be given, when I come to treat of Vines trained in the Vinery, the method of practice in both situations being nearly similar.

I shall now return to the consideration of the management of those Vines which are intended to be trained against the rafters, or roof, of the house.

These Vines will require a management, in future seasons, nearly similar to that already described; and although it will not be advisable to prune every other Vine-plant down so near to the bottom of the rafters, as has been directed for the two preceding seasons, yet it will be frequently found necessary to cut an old shoot down nearly to the bottom, that is, down to the lowermost summer shoot, as near to the bottom of the
rafter

rafter as can be. And the side-shoots of the Vines on the remaining rafters should not be permitted to ramble over the adjoining lights; but at the end of every season it will be proper to cut such shoots down to the second or third eye next the old wood, provided the bottom eyes are bold and strong. This must be done not only in order to strengthen the Vines, but also to prevent the roof of the house from being too much crowded with old wood.

And here it is necessary to observe, that, while the Vines are young, one rafter will afford sufficient room for a Vine-plant; but when the Vines are become older, they will require a larger space; and more especially, Vines of the strong growing kinds, which produce large leaves and large bunches: It will be proper, therefore, to train shoots sideways on the wall plate, from the stem of the plant immediately at its entrance into the house: These shoots should be carried up the adjoining rafters, and the plants, growing against such rafters, must be taken entirely away; except it should happen that the plant growing against such rafter is trained forward to furnish the back-wall.

In

In the large Hot-house at Welbeck, Vines are trained in the manner here described. Some of the plants occupy two, three, and four rafters each. A large Vine of the Syrian grape furnishes five rafters, and each branch being engrafted with a different sort, the plant, of course, produces as many varieties.

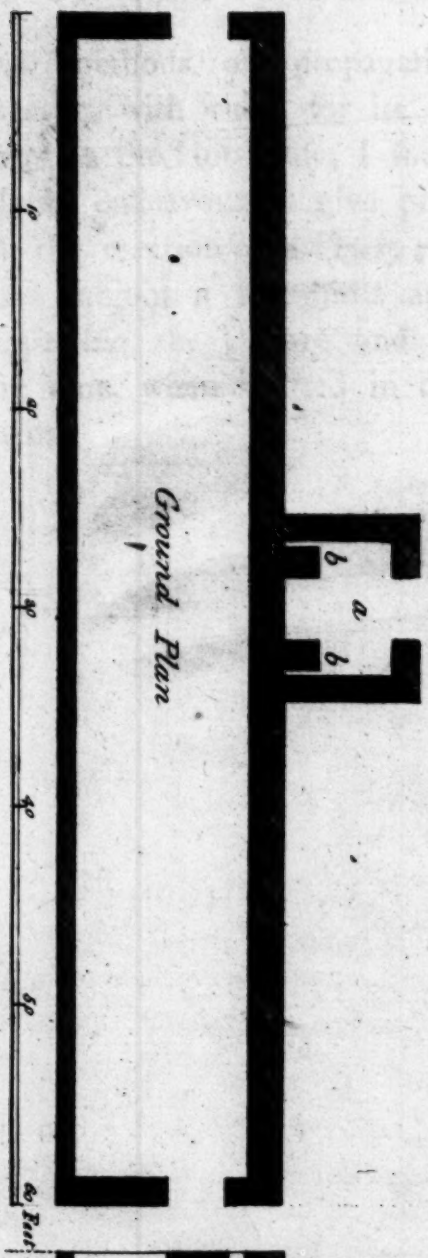
When a Vine-plant occupies two or more rafters, it will be right to prune occasionally, and particularly while the Vine is young, one or more of such Vine-shoots down nearly to the bottom of the rafter. This will not only contribute to strengthen the plant, but will also afford means to furnish the rafters with a succession of young wood.

When Vine-shoots are conducted to different rafters, in the manner above described, every shoot may be considered as a separate plant; and, whether grafted or otherwise, must be trained up the rafter in one shoot; and from that time it will require a similar management to that already laid down.

Having given full Instructions for the preparation of the soil, and described the vari-

ous methods of propagating the Vine, together with rules for its future management in the Hot-house, I shall, in the next place, endeavour to give proper directions for the erection of a *Vinery*; and afterwards shall subjoin a few hints and observations respecting the culture and management of the Vine, when planted in different departments.

ON



Section

of the wall, complete a proper terrace for

It is usual to have upright glass, of about
two and a half feet high in front, to

support the roof; and this is very proper

when the vines are intended to be trained at an

V I N E R Y.

angle to the border, which is generally occu-

ried with various kinds of flowers, growing ve-

getated; but where grapes are not wanted

experience **B O O K II.**

may be found, as in this case, a low wall in

THERE are various methods of con-
structing Vineries. Every large and
commodious building, appropriated solely to
the purpose of producing grapes, is gene-
rally termed a Vinery, while those erections,
of less dimensions, are called Grape or
Vine-frames.

I shall first treat of the most useful form.

Flued walls of about twelve or fourteen
feet high, in a direction from East to West,
with a roof and glass lights covering a bor-
der of about ten feet wide on the South side

of the wall, compose a proper receptacle for the production of grapes, or a Vinery.

It is usual to have upright glasses, of about two and a half or three feet high in front, to support the roof; and this is very proper when Vines are intended to be forced at an early season, because it admits the sun and light to the border, which is generally occupied with various kinds of low-growing vegetables; but where grapes are not wanted at an early season, a considerable expence may be saved, as, in that case, a low wall in front will answer equally as well. The shade of this wall would be very injurious to the border, if the Vines were to be forced early in the spring; but the meridian altitude of the sun, in the beginning of summer, renders it no way prejudicial at that season.

Supposing a flued wall, twelve feet high, the breadth of the border ten feet, and the height of the upright glass frame, or wall, in front, three feet, the roof will then form an angle of about forty-three degrees. Experience shews this to be a proper pitch for Vines forced after the vernal equinox. I mention this circumstance, because some persons,

sons, who give designs for buildings of this kind, lay so great a stress on this point, as to pronounce a Vinery, or Peach-house, incapable of answering the intended purpose, should the pitch of the roof happen only to vary a degree or two from their favourite angle. Indeed, if we suppose the sun's meridian altitude always the same, such an objection would rest on a solid foundation; but we know that it not only varies daily, but many degrees in a short space of time; so that if the pitch of the roof depend on so nice a point, what might be deemed right in the early part of the spring, would certainly be wrong later in the summer.

In Holland, it is customary to force Vines in November, in order to have ripe grapes early in the spring. In these frames, used for winter forcing, it is found necessary, that the glasses should be in an almost perpendicular direction. The Dutch have also a method

At London, latitude 51. 30. N. in the summer solstice, (June 22) the meridian altitude, or sun's place above the Horizon at noon day, is $63\frac{1}{2}$ degrees.—But at the winter's solstice, (December 22) it is only $16\frac{1}{2}$ degrees above the Horizon.

a method of forcing Vines planted in the open ground, the shoots of which are trained in an horizontal position, about eighteen inches from the ground. Over the Vines, which are forced in the summer, they put frames nearly as flat as those commonly made use of for melons.

Hence it follows, that the construction of the different frames, or buildings, for the purpose of producing grapes, should not only vary according to the quantity required, but also according to the season in which that fruit is intended to be produced.—The roof should be steep for early forcing, and flatter for the summer.

As I have given a plan and explanation of a Vinery, which has constantly succeeded in producing good crops of grapes for more than twenty years, it may seem unnecessary to say more upon this head; for the satisfaction, however, of those who wish to proceed on a less extensive and more economical scale, I shall suggest a few more hints upon this subject in another place.

The

The construction of the building being determined, the next objects which demand our consideration are, the compost proper for the border, and the method of raising Vine-plants to furnish the wall.

But then, as I have, in the former part of this work, explained myself fully on both these heads, a repetition of them here would be altogether needless and superfluous.

We will then suppose both the wall and border to be complete, and plants wherewith to furnish them ready.

Vine-plants raised in pots will sometimes make a good progress the first summer, when planted out for good about the month of June: but it is hardly possible to get the border in proper order for planting the same summer that the wall is built, because the ingredients of which it is composed require much time, and a winter's frost is of great use in causing them to incorporate, meliorate, and settle. The same care will, therefore, be required in preserving the plants through the winter, as has already been recommended for those intended for the Hot-house.

Hot-house. And so at the pruning season, the Vine-plants intended for the walls should have been previously pruned down to nine or ten inches, as has been already directed.

The beginning of March is a fit season for planting the Vines: But the choice of proper kinds, which has been already treated of, and the distance at which they should be planted, ought previously to be ascertained.

It should seem that sufficient attention had not hitherto been given to the latter of these heads of consideration, because we find it is the common practice to plant all the different sorts at the same distances. Whereas the different degrees of vigour, and manner of growing of the different sorts, require larger or less space to be allowed, in proportion to the natural character and qualities of the plant.

It happens but too often, that the space allowed to Vines is too scanty and insufficient, as we seldom see the distance between plant and plant greater than three or four feet. Now it is certain that a wall will soon get furnished by this close method of planting,
and

and that tolerable crops of grapes may also be produced in a few years. But if Vine-plants be permitted to remain many years so close together, they will be cramped in their growth for want of room, and thereby rendered less productive.

Suppose a wall twelve feet high, and the Vines planted even five feet apart, there will then, upon an average, be only sixty square feet for each plant; and yet we know that it is possible for a Vine to occupy more than twenty times that space.

I should recommend a space of from six to twelve feet between plant and plant, according to the sorts of Vines intended to be planted, that is, about six feet for the weak and delicate-growing kinds, and twelve feet for those that grow robust and strong. If these various sorts were judiciously mixed at the planting, about nine feet may be allowed upon an average.

The Vines thus planted, are intended, in due time, entirely to cover the wall; but as it is very desirable to obtain a crop of grapes as soon as possible, it will be eligible and expedient

pedient to plant other Vines between for immediate bearing. But now as these of the intermediate plantation must be trained very differently from the former, I shall, for distinction sake, call them *temporary* plants, the other *principals*. One temporary plant should be placed in the middle of every space between the principals. Plants that have been two or three years in pots, and that will come into immediate bearing, are most proper for this purpose. They must all be planted with the same care as has already been recommended for Vines in the Hot-house, and arranged close to a trellis fixed in the wall, and to which their shoots are to be trained.

In planting the principals, it will be proper to set the plants so, that the two uppermost eyes in each may stand fair for the shoot's going to the right and left: The necessity of this caution will be clearly explained, when I come to treat on the method of training.

Hitherto I have only taken notice of planting the flued wall, but it will be necessary to observe, that a few plants may be

set against the front wall also, in order to their being trained up the rafters. These may either be planted within or on the outside of the Vinery, as the front wall should stand upon arches, to afford the roots of the vines an opportunity of extending their fibres to a border on the outside. If planted on the outside, the Vine-shoots must be taken through small holes made for that purpose under each rafter. Great care, however, should be had respecting the future management of these, to prevent their injuring the Vines of the flued wall; but of this I shall have occasion to speak more fully elsewhere.

As soon as the Vines are planted, the border should be pricked over about three or four inches deep, and made smooth: Then the glasses should be put on, as it is of consequence that the Vines should shoot off with vigour. Gentle fires should be made in an evening, plenty of air given in the day-time, and especially when the weather is fine and clear.

The Vines will immediately begin to grow: The principals must be divested of all the shoots

shoots but the two uppermost, which are to be trained sideway to the right and left : These shoots, however, are not to be brought down to an horizontal position till the next winter's pruning.

As the temporary plants are intended to occupy the upper part of the wall, while the principals are furnishing it below, let the shoots of those be trained upwards for that purpose.

The Vines planted in front must be trained with one shoot only from each plant, exactly the same as has been directed for the Vines in the Hot-house.

If any of the Vines shew fruit, the bunches should be pinched off as soon as they appear.

From the time the plants begin to grow, they will require a little water once or twice a week, according to the state of the weather.

As the shoots advance, they should be regularly fastened to the trellis and rafters :

They

They should also be divested of their tendrils and laterals whenever they appear. It will be necessary to hoe and rake the border, in order to clear it from weeds and other noxious matter, every eight or ten days. For to keep the surface clean and constantly stirred, is of infinite advantage to the Vines, both on account of the sun's reflection, and as contributing to the greater purity of the air. If the border be permitted to grow foul, covered with weeds, moss, and the like, a moist and hurtful vapor will be generated, which will greatly retard the growth of the Vines.

There will be no necessity to continue the fires longer than the middle of April, unless the weather should be uncommonly severe. And in the month of May plenty of air should be given in the day-time; a little at night also, except there should be an appearance of frost.

In the beginning of June, supposing the spring frosts over, and the weather favourable, the glasses may be entirely taken off.

While

While the glasses are off, the border should be kept clean and the Vines constantly watered, if the weather prove hot and dry. And moreover, as the shoots advance, they should be kept regularly fastened to the trellis.

If the foregoing directions be duly observed, the Vines may be reasonably expected to make a good progress the first summer. But as it is of great consequence to have the wood perfectly well ripened, and as it is very liable to be injured by early autumnal frosts, it will be advisable to put on the glasses in the beginning of September: Should the weather prove mild and fine, this, however, may be deferred till the latter end of that month.

When the glasses are put on, let plenty of air be admitted both day and night, till the end of October; except the weather proves very severe, a little frost at night will not injure the plants. It is a material point that the leaves should be kept upon the Vines as late in the year as possible; for as long as the leaves are retained, the wood continues to receive benefit.

As

1871

1872

1873

1874

1875

1876

1877

Fig. 1.



2.



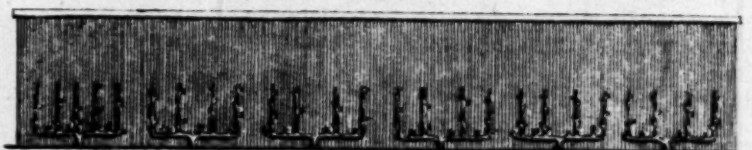
3.



4.



5.



6.



7 20 30 40 50 60 Feet

*Six different Stages of Vines trained
against a Wall*

As soon as the leaves are fallen, it is a proper time to prune the Vines ; but as the method of training Vines, which I am now going to enter upon is quite new to the public, and because it pleases more, and makes a greater impression upon the mind, to see things represented than to read a description of them in words, I have given a plan exhibiting the principals in six different stages. The temporary plants not requiring any particular mode of training, are purposely omitted in this sketch.

The shoots of the principals must all be cut down to three, or four eyes, making choice of the best and boldest eye to terminate the shoot. The shoots should be brought down as near to an horizontal position, as can be without straining, and then tied to the trellis.

It is easy to conceive, that every principal will then form a figure resembling the letter T. See plate iii. fig. 1.

If the temporary plants should be large, and been trained in pots before planting, which I have already observed, they will, in general,

general, have made good wood. The shoots of these may be pruned down to from six to fifteen inches according to the strength of the shoot, i. e. a weak shoot to six inches, if moderately strong to nine or ten inches, and if very vigorous to fourteen or fifteen inches. When pruned, the shoots should be fastened to the trellis in regular order.

The plants against the rafters must all, without exception be pruned down to the very bottom of each, that is, each shoot must be cut so low, as only just to admit of length sufficient for its being fastened to the bottom of the rafter.

It will be prudent to let the glasses remain on, a few days after pruning, and especially if the weather should be either severe or rainy. After the glasses are taken off, it will be necessary to lay a little mulshing round the bottom of each plant, to prevent the frost from injuring the roots : It is necessary also to observe, that dung newly made, or too much decayed, is not so proper for this purpose, as dung that is in a dead state and rather strawy. Dung from the outside of hot-beds made in the spring, is, in general,

ral very fit for multhing. This should be laid to the distance of two feet every way from the stem of the plant, and to the thickness of three or four inches. A little very rotten dung may be very thinly spread all over the border. This completes the business of the first season.

As the Vines will require the same management the succeeding year, a repetition of these directions will be unnecessary.

The principals must again be trained with two shoots only from each plant, and the Vines at the rafters with one shoot each, the same as in the preceding season. The temporary plants will probably shew much fruit, but all the bunches should be pinched off as soon as they appear, because the Vines would require a different management, in order to ripen the grapes, which would hardly be worth the additional expence of fuel, &c. Besides, the Vines will not make near so great a progress, if the fruit should be permitted to remain.

If no unforeseen accident happens, the Vines will, in general, make extraordinary

K

strong

strong wood the second season, and the shoots may, in general, be suffered to grow almost to the top of the wall before they are stopped.

The second year's pruning must be performed very differently from that of the preceding one; the shoots of the principals must all be brought down to an horizontal position, and pruned in such a manner as to leave a space of twelve or fourteen inches between plant and plant. See plate iii. fig. 2.

As the temporary plants are intended only to produce fruit for a certain period, namely, till the principals get sufficiently large to occupy the whole of the wall, they must be pruned for fruit accordingly. A strong shoot may be pruned to from fifteen to twenty eyes for bearing; between every two bearers, a shoot should be pruned down to two, three, or four eyes, in order to keep up a succession of bottom-wood, till the principals furnish a full supply all along the bottom of the wall.

If

If all the Vines at the rafters have grown equally strong, it will be proper to prune every other plant down to three or four eyes, and the rest to from twenty to twenty-five eyes each, the latter operation being intended to produce fruit, and the former to make bearing wood against another year.

By the end of the second year after planting, the Vines will have extended their roots to almost every part of the border : And as at this tender age the roots are very liable to receive injury by severe frosts, I would advise the borders to be covered the thickness of three or four inches, with long dead strawy dung. Dung taken from the outides of hot-beds is exceedingly proper for this purpose. There is a kind of spirit in dung which produces warmth, and thereby prevents the frost from penetrating the ground, especially if the dung be laid to a considerable thickness.

This method of covering the border should be practised every winter, while the Vines are young ; but then the dung should constantly be removed from the border as soon as the winter frosts are over : A little of the

very rotten dung may be permitted to remain, as this, with the addition of a little rotten cowdung, should be worked into the border every spring^b; Great care, however, should be taken not to injure the roots of the Vines;

^b As it is very important to know what kind of manure is the most proper for Vines, and also the most eligible season of applying it, I trust the following extract will prove highly acceptable and satisfactory to my readers:

“ My landlord told me, that he had an intimate acquaintance, at Vignerons, at Verzenay, who was reckoned one of the most attentive and careful managers in all the country, and, if I pleased, he would give me a letter to him, requesting him to give me all the information I desired.

“ This I readily accepted, and accordingly, when I arose in the morning, he had it ready for me. I proceeded to Verzenay, where I inquired for the Vignerons the landlord at Chalons had wrote to. I was presently shewn his vineyard, with his house by the side of it. He read the letter, and received me with a certain air of hospitable pleasure.

“ We walked directly into his vineyard, which was dunging, in trenches dug for that purpose. This introduced a conversation on that point, in which he explained the modes and principles of dunging vineyards.

“ The

Vines; and, therefore, the border should not be worked deeper than two or three inches. This work is best performed with a three-pronged fork.

Although

The season for dunging most approved here, is directly after the vintage, and to be finished before the winter sets in. It is all carried in on the heads of women and children in baskets. It is of consequence to have a dry season for the work of dunging, otherwise it is very badly performed. The women empty their baskets in trenches dug for that purpose, which are doing at the same time, and others spread it in the trenches and cover it with mould immediately. These trenches vary; sometimes they are made along the centre of the intervals, at others they are dug between the plants. The sort of dung they prefer most is cow-dung, that is, the cleanings of the cow-houses, which are well littered with straw or stubble for that purpose: Horse-dung is also used, but only on stiff soils. The cleanings of sheep-pens, littered, is much valued, and they think the litter of as much consequence as the dung. The peasants, vine-dressers, inhabitants of villages, and, in short, every body that keeps a single cow, takes care of the manure, forming it regularly into a heap for sale, and it is bought by the proprietors of the vineyards at so much a basket. They reckon that from five to eight hundred baskets are necessary for

“ an

Although many good grapes may be obtained the third summer, and especially from the temporary plants, yet it will be prudent to have a regard to future wood, rather than to the crop.

It

“an acre of Vines. I saw the baskets, and reckon
 “them to hold about half a bushel, so that eight
 “hundred baskets are four hundred bushels, which I
 “take to be about twelve or thirteen common farmers
 “cart-loads; and this manuring is repeated every
 “four or five years.

“The price per basket varies according to the sort of
 “dung and litter, but it generally comes to five or
 “six shillings an hundred, delivered in the vine-
 “yards; but if very good, to seven or eight, and
 “sometimes more has been given.

“Making dung is so much attended to throughout all
 “the wine country, that every means are used to in-
 “crease the quantity.

“All cattle are kept in houses as much as possible, and
 “littered straw is used for this; also stubble, which
 “is pulled up by hand: Rubbish wood from forest
 “land, leaves of trees swept up, and fern from waste
 “tracts; every thing is applied to litter with the
 “most unremitted attention. Much cattle are kept,
 “especially cows. These are fed by every means
 “that can be taken. Every weed that is picked up
 “in the vineyards, every blade of grass that arises, is
 “saved

It is an injudicious practice to endeavour to get an early crop from young Vines, as in that case it will be required to make fires early in the spring, which would prove very prejudicial to the Vines, by forcing them out

at

“ saved with as much care as the grapes, and given
“ to the cows.”

“ Dung is, however, sometimes laid on in March, but
“ is not reckoned so proper for that work as Autumn.

“ The quantity is the same at either season. Over-

“ dunging they reckon prejudicial to Vines, causing

“ them to run too much to wood, giving the wine a

“ heaviness, and making it apt to grow motherly.

“ But this depends on the soil; for some lands are

“ so deficient in natural fertility, that, unless they

“ are dunged more than commonly, they will not

“ yield a crop: They laid a thousand baskets on such,

“ and sometimes even so far as twelve hundred.

“ I objected that this general spirit of dunging vineyards

“ must rob all the common husbandry in the country;

“ that, replied he, is of no consequence, for corn

“ will not pay for dung where there are vineyards to

“ demand it. Upon my doubting this, he seemed to

“ lay it down as a maxim that could not be contro-

“ verted.”

Marshall's Travels, vol. iv. p. 78.

* The whole of this paragraph merits particular attention, and is truly worthy the farmer's unremitting imitation.

at a season when much air cannot be given, for want of which the shoots would grow weak and long-jointed.

The latter end of February, or beginning of March, is quite soon enough to begin to force. Moderate fires should be made for two or three days before the glasses are put on, as this will dry the wall, and prevent a strong steam from arising in the house. The border should be raked smooth; and if a little fine sand be thinly sprinkled thereon, it will contribute to the sun's reflection, to the wholesomeness of the air, and give a neatness to the house.

Plenty of air should be given whenever the weather will permit, and especially for the first ten or twelve days. This, with moderate fires, will cause the buds to break turgid, bold, and of a good colour. When a Vinery is kept warm and close at this critical season, the buds generally break pointed, weak, and of a yellowish hue.

Vines that have been exposed to the weather, generally break at almost every eye when forced at this season. The case is different

ferent with those that are constantly covered, as has been observed in treating upon Vines in a Hot-house.

Many of the superfluous shoots should be rubbed off as soon as they appear, as this will contribute to invigorate the remaining shoots. And as soon as the bunches appear, it will be proper to go over the Vines, and carefully divest them of all but the necessary shoots.

The shoots should not be left on the principals nearer together than twelve, fifteen, or eighteen inches; a matter to be determined by the kinds, that is, whether they produce small or large leaves.

Much care and judgment are also required in the choice and disposition of these first-rising branches, as the beauty and regularity of the Vines depend entirely on a judicious disposition in training their branches at first. The shoots from the principals must all be trained in a perpendicular direction; and even supposing them very strong and vigorous, not more than one bunch should be permitted to remain

remain upon each. These shoots may run five or six feet before they are stopped.

The temporary plants will, in general, shoot very strong, and shew much fruit. Either three or five shoots may be left upon those branches that were pruned to fifteen or twenty eyes, that is, a leading shoot from the top, and one or two on each side. The latter should be stopped at the second, third, or fourth joints above the uppermost bunch, but the leading shoot should be suffered to run nearly to the top of the house. Only one shoot should be left upon those that are pruned down to three or four eyes, and this shoot must be stopped at the third or fourth joint above the bunch.

The shoots at the rafters, that were pruned to twenty or twenty-five eyes each, will probably push at all of them; but not more than five or seven shoots should be permitted to remain, even on the strongest, viz. a leading shoot, and two or three on each side. Observe, one shoot upon each should be left as near to the bottom as can be, as the whole plant will require to be pruned down to this shoot the next winter.

Only

Only one shoot should be left upon those Vines that were pruned down to three or four eyes, (I suppose at every other rafter) and this must be trained up the rafter as in the preceding year.

In spring, the weather is frequently very variable; and, therefore, it will be necessary that the gardener should pay strict attention to every part of the management of the Vinery himself; and particularly to the fires, admission of air, and watering of the border. If these be left to the care of labourers, the success will be very precarious, since it is from an attentive, proper, and judicious apportionment of heat, air, and moisture, that we must look for success.

Particular attention will be required when the Vines are in flower, as a small neglect, at

At the time of the Vines flowering in a Vinery, &c. the air is impregnated with effluvia of a very agreeable scent. This circumstance is noted in a passage in the *Canticles* ii. 13. very remarkable and expressive. The words are, 'The Vines with the tender grape give a good smell.'

As

at that critical season, would be attended with the most fatal consequence. If the weather should become hot and dry, the flowers of many kinds of grapes are liable to fall off: A cold dark season also will sometimes produce the same bad effect. I may add too, that an extreme degree of fire-heat will prove equally prejudicial.

The air in the house should not, at any time, during the flowering season, exceed eighty-four or eighty-five degrees of Fahrenheit's

As even a very few bunches in flower are capable of affording a sensible and very pleasing odour, it seems somewhat extraordinary that Sir Thomas Brown should have thought differently in his comment on the above text.

"That the flowers of the Vine should be emphatically noted to give a pleasant smell, seems hard unto our Northern nostrils, which discover not such odours, and smell them not in full vineyards; whereas in hot regions, and more spread and digested flowers, a sweet savour may be allowed denotable from several human expressions, and the practice of the ancients, in putting the dried flowers of the Vines into new wine, to give it a pure and flowery race or spirit, which wine was therefore called *Ovinus*, allowing unto every *Cadus* two pounds of dried flowers."

Sir Thomas Brown's Miscellaneous Tracts, page 25.

Fahrenheit's Thermometer; and, in a dark cold season, should be kept up to sixty-four or sixty-five degrees.

The surface of the border should be kept in a moist state, by being constantly sprinkled with water, for grapes set best in a close sultry moist heat.

As soon as the grapes are grown to the size of small shot, the bunches of the close-growing kinds should be thinned in the manner already described.

Pinch off the tendrils and laterals whenever they appear; divest the Vines of all superfluous shoots that may be produced during the summer, that so they may have nothing unnecessary to support. Keep the shoots, as they advance, regularly fastened to the trellis and rafters, and never suffer them to grow in a rude and disorderly manner. Vines managed in a masterly manner should always be kept in a neat state, and therefore will require almost daily attendance.

If

If at any time, during the months of June, July, and August, the weather prove very hot and sultry, hardly too much air can be given to the Vines. I have sometimes taken the glasses entirely off the Vines during a violent hot season, and have always found the grapes to swell exceedingly during such a constitution of the air. Besides, the Vines will be greatly benefited by this mode of treatment, and especially when there are copious dews and refreshing showers. It will be proper, however, to put on the glasses at the time of the ripening of the fruit, as there is no depending on the flavour of the grapes when exposed to the weather.

It is highly proper to keep the border in a moist state during the time of the swelling of the fruit ; but when the grapes change, and become nearly ripe, water should be given very sparingly ; since, if the border were at that time kept too wet, it would debase the flavour of the grapes.

As soon as the grapes are all cut, take off the glass from the frames, and give the border a very plentiful watering, which may be repeated two or three times in the space of
eight

eight or ten days, in case of dry weather.—
From this time till the pruning season, the
Vines will require a management similar to
that of the preceding season.

In pruning the principals this third season,
only one general rule is to be observed;
which is, to prune all the shoots produced
from the horizontals down to three or four
eyes each. See plate iii. fig. 3.

The shoots of the temporary plants must
be pruned according to their strength and vi-
gour; observing, however, to prune the
lower shoots of each plant down to three or
four eyes, in order to furnish a succession
of bottom-wood. But the strong leading
shoots may, nevertheless, be left to a pretty
good length, viz. from eight or ten to sixteen
or eighteen eyes, according to their strength;
by this means the upper part of the wall will
be completely furnished.

Those Vines at the rafters, that have borne
a crop, must all be pruned down to the low-
ermost shoot on each, which shoot should be
shortened to four or five eyes; and the
Vines between the bearers (i. e. at every
other

other rafter) should be cut down to twenty or twenty-five eyes, or, in general, to about two-thirds of the length of the rafters.

In the following and all succeeding seasons, the Vines will require a management similar to that of the preceding one; therefore a repetition will be unnecessary.

As the Vines advance in age, they will certainly be enabled to produce every year, for a certain period, a larger crop of fruit: It is to be observed, however, that this must always be proportioned to the strength and vigour of the Vines.

By this mode of treating Vines, a large crop of fruit may be obtained every season. The Vinery at Welbeck has produced constant and large crops of grapes for the last twenty years, and the Vines at this time are exceedingly healthy and vigorous. The strength and vigour of Vines may be retained even for ages, where the forcing is carried on in a mild and moderate degree, just to assist nature and our seasons, so as to endeavour to bring the temperature of a Vinery as near as may be to the climate in which Vines succeed

ceed best in the natural way. Gentle and moderate forcing will always be found to answer this end best, and at the same time be attended with the least expence.

The principal thing now to be considered is, the method of pruning and training the Vines, and particularly the principals, till the wall gets fully covered in every part.

Training and pruning of the principals, the next or fourth season, must be the same as directed for Vines at the back wall in the Hot-house. See page 125, viz. only one shoot trained from each spur, which shoots must be pruned to a long one and a short one alternately, as is there directed. See plate iii. fig. 4.

From every long shoot, i. e. those pruned to about four feet, five shoots should be trained the next or succeeding season, viz. two shoots on each side, and one leading shoot at top.

At the next or fifth winter's pruning, observe to cut the four side shoots down to two or three eyes each, and the top shoot to six

or seven eyes, or, in general, to about one and a half feet. See plate iii. fig. 5.

The shoots between the uprights must constantly be kept pruned down to two or three eyes each, in order to keep up a competent succession of the bottom-wood.

In the following or sixth season, the training and pruning must be nearly the same as in the preceding, with this only difference, that the uprights having advanced one and a half feet, every upright will admit of two side shoots more than in the former year, viz. three on each side. See plate iii. fig. 6.

When the Vines are arrived at this stage, the wall will, in the next summer, be completely covered by the principals only; and, therefore, the temporary plants should, by degrees, be previously cut away to make room for them.

Here I wish not to be understood, as affirming that the principals will always arrive at this state, (viz. the sixth stage) at the sixth season after planting.—Vines are liable to impediments

ments and obstructions from various causes ; and so long as they make weak shoots in the summer, they must invariably be cut down to two or three eyes at the next winter's pruning, without having regard to any of the stages, as has been set forth.

The future management of Vines, thus completely and regularly trained, will not be very difficult.

It is natural for Vines to produce shoots plentifully from the old wood ; therefore when any of the side shoots of the uprights, or the bottom shoots between them, by their annual progress, rise too much from the old wood, they should be cut out at the next winter's pruning ; and it will be further necessary to make a reserve of some new shoots to supply their places.

Also, when leading shoots of the uprights advance beyond due bounds, it will be expedient to cut all such shoots entirely away, down to the next side shoots below, which shoots should be trained upwards to form new leaders.

By this method of practice, a Vine-wall may be constantly kept in a regular and elegant form, without varying much above or below the true and proper standard.

In regard to the future management of the Vines at the rafters, it should be observed, that though it will not be absolutely necessary to adhere invariably to the rule laid down of annually cutting every other Vine down to the bottom of the rafters, yet it will be proper to keep these Vines from extending too far over the glass frames, and thereby shading the house, which would tend to injure the Vines against the back wall. The method, therefore, of constantly cutting down some of them, and the training of one shoot from each, as has been already directed, will, of all others, be found to be the most eligible and successful practice.

It only remains for me to mention the early crops of choice fruits and Vegetables, which may be obtained from the Vine-border. It is usual, in works of this sort, for Gentlemen to promise much to themselves, by planting the border with standards, half standards, and dwarf-trees of various kinds

kinds of choice fruits, such as peaches, cherries, &c. together with crops of strawberries, pease, lettuce, &c. in abundance under them.

I confess the idea of this luxuriant profusion affords the mind a satisfaction truly pleasing. But those, who pursue such modes of practice, would do well to fortify their minds against future disappointments.

It should be considered, that the success of the Vines trained against the flued wall, is the first and principal object. A few good grapes may be got from the Vines at the rafters, and without doing any material injury, provided the Vines are judiciously managed; but if the Vines at the rafters are permitted to extend themselves too far over the glass-frames, or if the border should be close planted with tall-growing fruit-trees, the Vines at the wall will, by this means, be deprived both of sun and light, and will be thereby soon reduced to an undesirable state of imperfection: Besides, by such imprudencies, the border too will soon be impoverished, so that disappointments will attend every future prospect.

It

It is certain, that the less the border is cropped with vegetables, &c. the better; and yet a few articles may be procured in the spring, without much damage to the Vines. And in this case I would recommend, that the border should be furnished with plants growing in pots, such as strawberries, rose-trees, carnations, and various other sorts of choice flowers; nay, I should not much object to peach, fig-trees, &c. trained in pots. But even these should not be introduced in too great quantities, which would give the house an appearance of being crowded. To conclude this short business, by allowing a proper space to every plant, and by a strict observance of the foregoing rules, every thing will thrive; and the general result will be both satisfactory and advantageous.

FURTHER

FURTHER OBSERVATIONS

ON THE

CULTURE

VINE, ON VINERIES, VINE-FRAMES, &c.

IT has been already observed, that there are various modes of constructing buildings for the purpose of improving the culture of Vines.

Vineries, or Grape-houses, are ~~some~~ built on commodious ~~are~~ those which have most elegant glass-framed roof, with one side ascending to the East, the other to the West: The South end must consequently be glazed as buildings of this construction are spacious, and will admit air to be given on

on every side, they are equally proper for forcing many kinds of fruits, as peaches, cherries, figs, &c. In such houses, however, the Vines should be trained to the rafters only, and the other fruits as standards, dwarfs, &c. permitted to occupy the space below. But as these buildings admit the meridian sun only at the end of the house, they are very improper for producing grapes at an early season.

Another kind of Grape-house is constructed on a plan similar to that of a single-pitted Pine-stove. In this, the flued wall should be about fifteen feet high; the roof should be slanting, and should cover an extent of about sixteen feet; and a flue should also run from the Eastern to the Western extremity, near the front wall of the house. These buildings are not only well calculated for grapes, but also for early crops of cherries, &c.

As glass is the principal article of expense in erecting proper buildings for forcing, glass frames should be adapted, as much as possible, to answer different ends and purposes.

Where

Where there are peach-houses, the glass-frames may be made useful in a double capacity, by having a building for Vines constructed of the same dimensions as those of the peach-house. For as peaches do not require to be covered with glass later than the middle of summer, a crop of grapes may be got by means of the same glasses after that season.

Melon-frames may also be applied to a double purpose; good crops of grapes may be obtained from Vines trained against dwarf walls, that is, walls about six feet high. Here a small slanting roof should be made of proper dimensions for the melon-frame glasses. In both the last-mentioned cases, a small degree of fire heat would be of singular advantage, and might be applied either by a flued wall, the flue running through the house, or by cast-iron pipes, which are frequently used with success for this purpose.

I have already mentioned, that in Holland it is customary to begin forcing Vines as early as in the month of November.

The

The frames made use of for this winter-forcing are generally about twenty-five or thirty feet long, about five feet wide at bottom, and at the top about three feet. The height generally about ten feet, (the height of the Vine-wall to which the frame is affixed) so that the glass frames stand nearly in a perpendicular direction. The fire-place is at one end, the flue runs along the bottom to the opposite end, and generally returns to a chimney built in the middle of the frame.

The Vines are brought from the wall, and nailed all along the front, close to the glass frames, and are securely covered at nights. By this disposition of the branches, it is easy to conceive that there must be difficulty in moving along on the inside.

I have seen grapes in these frames in pretty good perfection in the month of April, and was informed that they are frequently ripe in the beginning of March. The bunches, however, are not very plentiful in these early crops. The black and white Sweetwater are the kinds preferred for this early forcing.

As

As this kind of forcing in a manner spoils the Vines, it is necessary to have the Vine-walls at least five times the length of the frame, in order to furnish a succession of well-perfected wood.

After the crop is over, the Vines, in the course of the ensuing winter, must be cut down nearly to the bottom, and they require a term of four or five years to recover themselves for another early crop.

The frame described would certainly admit of improvement, and flued walls would also be of further advantage, by co-operating with the flue on the inside of the frame. But still, this mode of forcing is by no means to be recommended in this country. On the continent, the sky is, for the most part, clear. There is almost daily sunshine, and the weather is regular and settled during the winter season. There nothing is required but attention to guard against the severity of the frosts; but in a climate so subject to variation as ours, the same method of forcing can never be approved, because no means have yet been discovered, to counteract the sad effects of the frequent cloudy dull days which

which we experience, and in which a strong fire-heat, such as would necessarily destroy all future hopes, must be applied. In short, vegetation cannot be carried on to any good purpose without the aid of the sun's heat ; and, therefore, though in forcing, it be easy to guard against the severity of the nights, yet there is no security against long-continued dull days, but by a strong fire-heat, which, at such a season, would undo all.

The method of forcing Vines planted in the open ground, as has already been hinted, will, in this country, be far more advisable than the foregoing practice, and is more particularly suitable to those persons who are not possessed of any of the larger buildings above described.

For this purpose the Vines should be planted about three feet apart, and trained in an horizontal position about eighteen inches or two feet from the ground. Large melon-frames may in this case be used to produce a late crop of grapes, after the melon season is over.

The

The bottom of the frame should be covered over with slate, or tiles, to prevent the damp of the ground from rising, and to reflect the sun's rays, to the great furtherance of the grapes.

A lining of hot horse dung, kept constantly round the outside of the frame, will also tend greatly to accelerate the ripening of the fruit.

The early kinds of grapes are the most proper for this method of forcing.

In countries where coal abounds, the Vines are sometimes forced by flued walls without any covering, but I have seldom seen good crops of grapes perfected this way; the berries on the bunches do not ripen equally: From the constant heat and reflection of the wall, the berries on the side of the bunch next it will ripen long before those in front, which will render the bunch unfightly, and hardly fit for the table at any season. Besides, both wall and border being at all times exposed to the weather, the fruit will become insipid in a long wet season.

season. It is further to be observed, that the berries of many sorts of grapes are very subject to crack in wet weather, after which they generally either soon decay, or become a prey to wasps and flies.

In some seasons there are many kinds of grapes which will ripen well against common walls, and particularly in the Southern counties of this kingdom. But Vines against walls, without any covering, are liable to several misfortunes. The reflection of the wall constantly brings out the young shoots at an early period in the spring. They are frequently injured, and sometimes totally destroyed, by sharp frosty nights, not unusual in the beginning of May, and which sometimes happen even at the latter end of that month.

A cold summer retards the ripening of grapes exposed to the weather, and a wet autumn renders them insipid and of little value.

In order to save expence, oiled paper is sometimes used instead of glass; but
Vines

Vines do not succeed well under such a covering, nor are the grapes so high flavoured, as when under glase. By the faintness of the beams of light which such a covering affords, the Vines will grow weak and long-jointed, and especially in a dull moist season, when much air cannot be admitted.

When oiled paper covers are used, they should not be applied till the Vines begin to push in the natural way, and even should be used at first only to defend the Vines from the cold of the nights, it will be necessary they should have free air in the day-time, to prevent their drawing weak.

The great damage done by oiled paper covers is, from the too close covering at the beginning of the season; but when the Vines come into flower, they are not so liable to receive hurt by close covering, because the wood cannot draw weak after the leaves are grown to their natural size. The ripening of the grapes may be greatly accelerated by covering after
this

this period, and more especially with the assistance of a little fire-heat, which may be applied as has been already directed, page 169.

When oil is applied to the Vines, it should not be applied till the Vines begin to push in the natural way, and even should be withheld till only to defend the Vines from the cold of the night, it will be necessary they should have free air in the day-time, to prevent their drawing water.

The great damage done by oil is, that it is too close covering at the beginning of the season; but when the Vines come into flower, they are not so liable to receive hurt by it as when they are in bud, because the wind cannot draw work after the leaves are grown to their natural size. The ripening of the grapes is greatly accelerated by covering them with this

FURTHER

A common error in pruning Vines, and

~~the most common of all, is the leaving too~~

much wood. It is no uncommon thing to

FURTHER OBSERVATIONS

be crowded, as almost totally to exclude the
sun: Vines trained up to the rafters in
hot houses, &c. are frequently in the same
predicament. But when vines are in health

PRUNING

and vigorous, the shoots of the former year's
produce, should not be crowded. The shoots
require a space from top, or twelve inches
to two feet and a half. This, however,

The success of Vines depends so
much on judicious pruning, that
one can hardly be too explicit in giving
directions upon this head.

Vines trained in the regular manner al-
ready directed, are much easier kept in
proper order, than those trained in the
usual way. But notwithstanding the full
directions before given, I am inclined to
drop some further hints on the subject, which
I flatter myself will be found of use.

A common error in pruning Vines, and indeed with most kinds of fruit-trees when trained against walls, is the leaving too much wood. It is no uncommon thing to see the leaves on Vine-walls so much crowded, as almost totally to exclude the sun: Vines trained up to the rafters in Hot-houses, &c. are frequently in the same predicament. But when Vines are in health and vigour, the bearing wood, which is, in general, the shoots of the former year's produce, should not be crowded. The shoots require a space from ten, or twelve inches, to two feet and a half. This, however, depends in a great measure on the kind of Vine, that is, whether it produces large or small leaves. Now, in order to form a better judgment in this matter, I shall here subjoin a list of the dimensions of the leaves of various kinds, as taken at different periods, from Vines growing in Welbeck garden.

LIST

LIST of VINES, shewing the Size of the Leaves, and the Length of the Foot-Stalks of various Species, taken at WELBECK.

| | Diameter of the Leaf. | | Length of Foot-stalk. | |
|------------------------------------|-----------------------|---|-----------------------|--|
| | Inches. | | Inches. | |
| 1. White Muscat of Alexandria | 12 | — | 8½ | |
| 2. Red Grape from Syracuse | 11 | — | 6 | |
| 3. Le Cœur Grape, or Morocco Grape | 9½ | — | 5½ | |
| 4. Aleppo Grape | 12½ | — | 6 | |
| 5. Black Damascus | 11 | — | 5½ | |
| 6. Black Grape from Tripoli | 11 | — | 5 | |
| 7. Golden Galician | 10½ | — | 5 | |
| 8. Black Muscadel | 11 | — | 6 | |
| 9. Red Muscadel | 10½ | — | 6 | |
| 10. White Grape from Alcobaca | 11 | — | 5½ | |
| 11. White Frontinac | 11 | — | 7 | |
| 12. Grizzly Frontinac | 11 | — | 6½ | |
| 13. Black Frontinac | 12 | — | 6½ | |
| 14. Blue Frontinac | 6½ | — | 4 | |
| 15. Red Frontinac | 10 | — | 6 | |
| 16. White Sweetwater | 9 | — | 4 | |
| 17. Black Sweetwater | 8 | — | 3½ | |
| 18. Black Hamburgh | 13½ | — | 7 | |
| 19. Red Hamburgh | 11 | — | 6 | |
| 20. White Hamburgh | 12 | — | 6½ | |
| 21. Malvoise | 9 | — | 5 | |
| 22. Genuine Tokay | 11 | — | 6 | |
| 23. Lombardy | 11½ | — | 7 | |
| 24. Smyrna Grape | 10 | — | 6 | |
| 25. Brick Grape | 6 | — | 4 | |
| 26. Black Spanish, or Alicant | 10½ | — | 5 | |

M 2

27. White

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| | <i>Diameter of the Leaf.</i> | <i>Length of Foot-stalk.</i> |
|--|------------------------------|------------------------------|
| | <i>Inches.</i> | <i>Inches.</i> |
| 27. White Muscadine, or Chaffelas | 11 | 5½ |
| 28. Black Muscadine | 9 | 5 |
| 29. Royal Muscadine, or D'arboyce | 12½ | 7 |
| 30. Malmfey Muscadine | 12 | 6½ |
| 31. Claret Grape | 6 | 4½ |
| 32. Syrian Grape | 17½ | 6 |
| 33. Miller's Burgundy | 5½ | 3½ |
| 34. Small Black Cluster | 5 | 3 |
| 35. Large Black Cluster | 6 | 4 |
| 36. White Morillon | 9 | 5 |
| 37. Early Black July Grape | 6 | 4 |
| 38. Cat's Grape | 5½ | 3½ |
| 39. Black Raisin Grape | 10 | 6 |
| 40. White Raisin Grape | 11 | 6 |
| 41. Damson Grape | 10 | 5½ |
| 42. Early White Grape from Tenerif | 9 | 5½ |
| 43. St. Peter's Grape | 10 | 7 |
| 44. Black Grape from Palestine | 10 | 6 |
| 45. White Parsley-leaved Grape, or Eiotat | 7½ | 4 |
| 46. Black Lisbon | 11½ | 6 |
| 47. Greek Grape | 6½ | 3 |
| 48. White Corinth Grape | 5½ | 4 |
| 49. White Muscat (from Lunel) | 12 | 8 |
| 50. Cornichon | 9½ | 5 |
| 51. Orleans | 8 | 4½ |
| 52. Transparent | 8 | 4 |
| 53. Pearl Muscadine | 10 | 5½ |
| 54. Amber Muscadine | 10½ | 5 |
| 55. Sheep's Tail (from Portugal) | 10 | 5 |
| 56. Humorous (ditto) | 11 | 5½ |
| 57. Deagalues | | |

| | <i>Diameter of the Leaf.</i> | | <i>Length of Foot-stalk.</i> | |
|--|------------------------------|---|------------------------------|--|
| | <i>Inches.</i> | | <i>Inches.</i> | |
| 57. Deagalues (ditto) | 10 | — | 5 | |
| 58. Cracking Grape (ditto) | 9 | — | 4½ | |
| 59. Small Yellow Grape (ditto) | 7 | — | 4 | |
| 60. White Constantia (from the Cape) | 12 | — | 7 | |
| 61. Small White Grape from Naples | 6 | — | 5 | |
| 62. Black Switzerland | 11 | — | 6 | |
| 63. Maiden Grape | 7 | — | 3½ | |
| 64. King's brown Grape | 8 | — | 4½ | |
| 65. Passe Musque | 12 | — | 7 | |
| 66. Jefferies Muscat | 12 | — | 6 | |
| 67. Champaign | 10½ | — | 5 | |
| 68. Large Purple Grape (from Portugal) | 11 | — | 6 | |
| 69. Peruvian Eye (ditto) | 12 | — | 6 | |
| 70. De do de Dama, or Ladies' finger (ditto) | 11 | — | 5½ | |

N.B. The above dimensions were taken, upon an average, from leaves of each species at a medium size.

In pruning, the usual method is, to allow the shoots a certain space, indiscriminately, to every kind of Vine; but surely nothing can be more erroneous.

In regard to distance, it will be easy to observe the foregoing rules; but the consideration of the required length of the shoots is a matter of more difficult determination,

When

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When Vines are in a weak state, they will always require to be short pruned, that is, the shoots in general should be pruned to two, three, or four eyes each.

And when Vines are only moderately vigorous, the shoots should be left about a span long. This, however, must be understood only of spreading Vines, that cover a good extent of walling, for Vines, trained in one shoot up the rafters, in a Hot-house, require a different treatment.

When Vines are in extreme vigour, they always produce the best grapes from shoots that are left a great length.

The height of a Vinery will seldom admit of shoots, be they ever so strong, being left longer than six or seven feet; but when vigorous Vines are trained in one shoot up the rafters, in a Hot-house, they may constantly be pruned to the length of eighteen, twenty, or twenty-two feet.—A person unaccustomed to this practice would, from hence, be inclined to deem this mode absurd, and would naturally conclude, that the Vines must be rendered weak by it. It is not, however,
from

from the length of the shoot, but from suffering by the next year's crop, that such danger is to be apprehended.

The extreme parts of these long and vigorous shoots always produce both bunches and berries of a remarkable size. The uncommon large bunches, that have been produced in Welbeck gardens, have constantly come from the uppermost eye of shoots of the above description.

I have already observed, that the spurs, produced from principal shoots, should invariably be pruned down to two, three, or four eyes, as occasion may require. And that when these extend too far from the principal shoots, which they will do in time by their annual progress, it will be proper to cut them entirely away: But previous to this, it will always be necessary to make a reserve of fresh shoots to supply their places.

When strong old wood, that is, shoots of four or five years growth, are to be cut away from any part of the Vine, the operation should be performed with a sharp knife, and the shoot should be cut off close to the bottom,

tom, that, when the part skins over, it may become smooth, and not left to grow ragged, as is but too generally practised.

By the common method of pruning Vines, the bole and large branches generally grow rough, ragged, and unsightly; and when Vines have long been under an injudicious management of this sort, it is hardly possible to reclaim them. But by due care, and discreet management afterwards, it will not be difficult to keep the bole and large branches of Vines smooth, and of an agreeable appearance.—I constantly peel off as much of the bark as can be gotten without injuring the Vines, and then wash the branches with strong soap suds; to be applied with a soft brush, such as is used for common painting: The time of winter pruning is the most eligible season to perform this operation, as then the Vines will not be in danger of bleeding. The soap suds are not only useful for giving the Vines a smooth and glossy appearance, but are also efficacious in destroying several species of insects that lodge upon them during the winter.

When

When Vines, through neglect or mismanagement, are reduced and become weak, nothing better than few small bunches can be expected from them. The best method to recover them, when in such a situation, is, by cutting them down, at the winter pruning, to the lowermost last year's shoot upon each Vine. The next summer's shoots should be divested of all the bunches as soon as they appear, and the shoots should be allowed sufficient space, viz. from twelve or fourteen inches to two feet and a half, according to the kind of Vine, that is, whether it produces small or large leaves. When the shoots are properly disposed, the leaves of one shoot should not be suffered to interfere with those of the next adjoining shoot. Thus, by affording a free admission of sun and air, the new wood will be greatly benefited.

Vines are often permitted to run into a rude and disorderly state during their progress in the summer. And it is also too prevalent a practice to fix upon certain periods for pruning, or dressing them as it is termed. But Vines, properly managed, require attendance almost daily, and particularly in the beginning of summer. All the supernumerary

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rary shoots should be rubbed off as soon as they begin to shoot in the spring, and those only should be retained, which will be required either for fruit or succession of wood.

The Vines will be greatly benefited by being thus disburthened of all their unnecessary shoots, which only tend to embarrass them in the regular disposition of the new wood.

In the summer pruning of Vines, the use of the knife should be avoided as much as possible; it is far more eligible to pinch off the shoots with the finger and thumb. The acidity of the juices, which abound in the young shoots of Vines, cause an immediate tarnish to ensue and appear on the blade of the knife; and this, if not poisonous, proves very injurious by incorporating with the juices in the wounded part.

As

The ancients were well aware of this circumstance. Virgil, in giving directions for summer pruning of Vines, expressly says,

“Nor

As all the different kinds of Vines are not distinguishable by the wood at the time of the winter pruning, a person, unacquainted with the kinds, might easily be led into an error, respecting the proper space that ought to be allowed for the shoots. If the wood should appear crowded, when the leaves are full grown, it will be proper to let it remain in that state during the season of the Vine's bleeding. But the superfluous wood may safely be taken from any part, at the time of the Vine's flowering, as they do not bleed at that season.

I have already observed, that the best season for pruning Vines is at the time of the leaves falling; because when the pruning is deferred till the spring, the Vines are liable to bleed on the rising of the sap, and especially at large incisions, where strong wood has been cut away; but when Vines are pruned in the autumn, there will be time during the winter for the wounded parts to heal, and for the pores to close, before the rising

“Nor exercise thy rage on new-born life,

“But let thy hand supply the pruning knife.”

“And crop luxuriant stragglers.”

rising of the sap in the spring. As Vines are sometimes greatly injured by their bleeding, it may not be deemed improper here to say a few words on that subject.

Vines, pruned even in the winter months, will sometimes bleed a little on the rising of the sap in the spring; but if a Vine gets wounded at that season, it will, like the birch, bleed copiously from the wounded part. "It is astonishing," says Mr. Evelyn, "that some trees should, in a few hours, weep more than they will weigh."

The discharge from the wounded part is, in a great measure, regulated by the state of the atmosphere.

It
 "In order that we may have a distinct view of the
 "motion of the sap, it will be necessary to reflect,
 "that the root, stem, branches, and leaves are con-
 "structed in the same manner. Sallows, willows,
 "Vines, and most shrubs will grow in an inverted
 "state, with their tops downward in the earth. Dr.
 "Bradley describes the manner of inverting a young
 "cherry-tree, the roots of which will put forth
 "leaves, and the branches become roots. Hence it
 "is

It is easy to stop a gentle oozing from an old wound of a Vine, by applying soft clay, putty, or warm wax to the wounded part: I have, however, sometimes found, that foot,
or

“is obvious, that the nutritive matter may be conveyed as well by the leaves as the roots, their vascular structure being the very same.

“During the heat of a summer’s day, all plants perspire freely from the pores of their leaves and bark. At that time the juices are highly rarefied; and the diameters of the Tracheæ, or air-vessels, are enlarged so as to press upon and straiten the vessels that carry the sap. In consequence of which, their juices not being able to escape by the roots, are pressed upward, where there is the least resistance, and perspire off the excrementitious parts by the leaves and top-branches in the form of vapour. When the solar heat declines, the Tracheæ are contracted. The sap-vessels are enlarged, and the sap sinks down in the manner of the spirits in a thermometer.

“In consequence of this change, the capillary vessels of the leaves and top-branches become empty. Being surrounded with the humid vapours of the evening, they fill themselves by the known laws of attraction, and send down the new-acquired juices to be mixed with those that are more elaborated.

“As soon as the sun has altered the temperature of the air, the Tracheæ become again distended, and the sap-vessels are straitened. The same cause always produces

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or charcoal dust ground very fine, and mixed with soap to the consistence of paste, has proved more efficacious.

It

“ produces the same effect ; and this alternate ascent
“ and descent, through the same system of vessels,
“ continues as long as the plant survives.

“ The irregular motion of the stem and branches is another cause that contributes to the ascent of the sap.
“ Every time that these parts are acted upon by the
“ air, they are made to assume a variety of angles,
“ whereby the sap-vessels are suddenly straitened.
“ The contained juices consequently receive reiterated
“ impulses, similar to what happens to the blood of
“ animals from the contraction of the heart. This observation may assist us in investigating the vegetable
“ œconomy, so far as it regards the management of
“ fruit-trees, and, probably, may be extended
“ throughout the whole system of gardening, planting,
“ and farming.

“ It may be objected, that trees fixed to the wall do,
“ notwithstanding, carry their sap to the extreme
“ branches ; but it should be considered, that the
“ warmth of their situation, assisted by the horizontal
“ direction of their branches, is fully sufficient to
“ propel the sap, without the undulatory motion that
“ I have mentioned.

“ I beg

It is exceedingly difficult, however, to stop the bleeding of a recent wound, and especially when the discharge is very rapid; as in such a case, I have sometimes found all

" I beg leave to observe, that these observations are only
 " intended to convey a general idea of the motion of
 " the sap. It varies according to the temperature of
 " the weather. The air is seldom one moment alike.
 " The sap must, therefore, sometimes move quick
 " and sometimes slow. It may rise and fall many
 " times in a day. Sudden heats push it upward,
 " sudden colds make it fall. Thus the juices are
 " blended, and the secretions forwarded.

" The manner that the nutritive juices of the earth and
 " atmosphere are conveyed into the sap-vessels, re-
 " mains to be described. And this makes a necessary
 " part of our present argument, that it may assist us in
 " finding out and explaining the diseases of plants
 " from the variations of the weather.

" The outer bark, which covers every external part of
 " a vegetable, as well below as above the surface, is
 " full of perspiratory, or absorbent holes. The
 " vessels of this bark, being endowed with the power
 " inherent in capillary tubes, draw up the moisture
 " that is applied to their surface. From them it is
 " committed to the vessels of the inner bark. After
 " receiving some degree of melioration, the sap is de-
 " livered to the blea. From the blea it passes, by
 " anastomosing canals, to the vascular series. From
 " thence

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all the above methods to prove ineffectual: Nor will the application of either pitch, bees wax, or sealing wax, (at the same time sealing the wounded part with
a hot

"thence to the wood or flesh, where it receives its
"last concoction.

"The nutritive particles, being separated by the mechanism of these numerous canals, are applied towards
"the fructification and increase of the plant, while the
"watery and excrementitious parts are carried expeditiously to the leaves, where they are perspired off in
"the form of vapour. It is evident, however, that, as
"water contains but few particles that are fit for nourishment, it was necessary that plants should have
"the power of imbibing a large portion of that fluid.
"For which reason, the sun-flower, considered bulk
"for bulk, takes in seventeen times more nourishment than a man, and, consequently, perspires
"more.

"During the continuance of dry North-East winds,
"the leaves of corn are observed to grow yellow,
"and the early-set fruit frequently falls off. This is
"owing to the want of moisture in the atmosphere to
"fill the vessels of the leaves and top branches,
"whereby the fruit is deprived of nourishment. Under such circumstances, it is probable that wall-
"fruit may be preserved by prudent watering the
"leaves and top branches during the heat of the day.
"It is, however, a singular happiness, that the air is
"at

a hot iron) answer the intended purpose.

N

When

“ at no time perfectly free from moisture. Bring a
 “ bottle of cold water into the warmest room, and its
 “ surface will immediately be covered with a thick
 “ dew. An air absolutely dry, would, in a few days,
 “ annihilate the vegetable creation.

“ The air is justly said to contain the life of vegetables
 “ as well as animals. It is a compressible and elastic
 “ fluid, surrounding the face of the globe, and reach-
 “ ing to a considerable height above it. Vegetables
 “ do not grow in vacuo, and animals die when de-
 “ prived of air. It has two states, being either elas-
 “ tic or fixed. Dr. Hales observes, that in its elastic
 “ and active state, it conduces to the invigorating the
 “ juices of vegetables; and, in its fixed and inert
 “ state, gives union, weight, and firmness to all na-
 “ tural bodies. By his experiments we are informed,
 “ that fixed air constitutes near one third part of
 “ the solid contents of the heart of oak. It is found
 “ to bear the same proportion in pease, beans and
 “ other vegetable substances. Heat and fermentation
 “ render it elastic. It is again capable of being ab-
 “ sorbed and fixed. Was the whole air of the uni-
 “ verse brought at once into an elastic and repulsive
 “ state, every thing would suffer a sudden dissolution.
 “ Was it entirely fixed, then all things would be re-
 “ duced to an inert lump. Almighty providence has
 “ provided

When a Vine bleeds rapidly, the most effectual expedient I have hitherto been able to devise to stop its progress is, First, to peel off, or divest that part of the branch

“ provided against these extremes, and in the most
 “ wonderful manner preserves the balance. Air is to
 “ be found in every portion of earth ; and as it al-
 “ ways contains a solution of the volatile parts of
 “ animal and vegetable substances, we should be care-
 “ ful to keep our stiff soils as open as possible to its
 “ influence. It passes, both in its active and fixed
 “ state, into the absorbent vessels of the root, and
 “ mixing with the juices of the plant, circulates
 “ through every part. Dr. Hales, in his Statical
 “ Experiments upon the Vine, discovered it ascending
 “ with the sap in the bleeding season.

“ Having demonstrated, that the motion of the sap
 “ depends upon the influence of the air, and the
 “ power of absorption common to all capillary tubes,
 “ it naturally follows that it cannot remain one
 “ moment at rest. The gradations from heat to cold
 “ and *vice versa*, are infinite, and sometimes desul-
 “ tory. So must the motion of the sap. From the
 “ combinations of the nutritive particles, a number of
 “ different fluids are prepared in the same plant.
 “ Matter is the same in all ; but the modification of
 “ it makes things sweet or sour, acrid or mild.

“ The universal juice of a plant is a limpid subacid
 “ liquor, which flows plentifully from a wound made
 “ in

branch adjoining the wound, of all the outside bark ; then with a sponge to dry up the moisture, and immediately to wrap round the wounded part a piece of an

N 2

ox's

“ in a tree when the sap is rising. The Birch and the
 “ Vine yield it in great abundance. This liquor, as
 “ it moves through the innumerable small vessels, be-
 “ comes more and more concocted, and is the gene-
 “ ral mass from which the juices are derived. It
 “ may be called the blood of the plant. By a cer-
 “ tain modification it produces high-flavoured oils,
 “ gums, honey, wax, turpentine, and even the con-
 “ stituent parts of the plant itself. How this trans-
 “ mutation is performed, remains, and perhaps ever
 “ will remain, unknown.

“ I hope it will not be objected to me, that in this essay
 “ I have been too minute. In the history of nature
 “ we cannot be too particular. Every part of it de-
 “ mands our most serious attention, and every part
 “ of it repays us for the labour we bestow. The
 “ wings of the butterfly are painted by the same
 “ Almighty hand that made the sun. The meanest
 “ vegetable, and the most finished animal, are equally
 “ the care of providence. We constantly view the
 “ wisdom of God in his works ; and yet, as the
 “ wise man observes, ‘ hardly do we guess aright at
 “ the things that are upon the earth, and with labour
 “ do we find the things that are before us,”

Georgical Essays, by A. Hunter, M. D. page 79.

196 FURTHER OBSERVATIONS, &c.

ox's bladder, spread over with tar, or pitch, made in the manner of a plaister. The whole must be securely tied with a strong thread, well rubbed with bees wax.

The bandage and bladder should be permitted to remain upon the branch for the space of three weeks, or a month, after the operation is performed.

GENERAL

GENERAL OBSERVATIONS

ON

WATERING THE VINE.

ALTHOUGH it is necessary that the situation of the Vine should be perfectly dry, and more especially in a cold climate where the winters are frequently very severe, yet Vines require a plentiful supply of water during summer, particularly in a hot dry season, and at the time of the swelling of the grapes.

In hot countries, the Vine is said to grow the most luxuriant in a situation which is near the water^f; but it is generally allowed, that

^f The Patriarchs and Prophets frequently represent, in Scripture, the flourishing state of a nation, a tribe, or family, under the emblem of a Vine growing near water,

“ It

that the flavour of the grapes, from Vines in such a situation, is much inferior to that of grapes growing in a dry soil.

I have already observed, in my directions for the preparation of the Vine-border, the absolute necessity of having drains at the bottom, to take off the superfluous water : By this means the border may be kept in a dry state during winter ; and, in summer,
water

“ It was planted in a good soil by great waters, that it might bring forth branches, and that it might bear fruit, that it might be a goodly Vine.” *Ezekiel* xvii. 8.

“ Thy mother is like a Vine in thy blood, planted by the waters : She was fruitful and full of branches, by reason of many waters.” *Ezekiel* xix. 10.

“ Joseph is a fruitful bough, even a fruitful bough by a well ; whose branches run over the wall.” *Gen.* xlix. 22. The Vine indeed is not expressly named here, but this tree, nevertheless, appears to be principally intended, on account of its very spreading nature, as appears from the two texts from *Ezekiel*, and particularly as it is remarkable for over-topping the walls it is planted against. See the beautiful Allegory in *Psalms* lxxx. of the over-prosperous condition of the Israelites ; “ Thou hast brought a Vine out of Egypt.”

water may be given as the season and other circumstances may require.

In spring, gentle and frequent waterings, in dry weather, generally answer better than giving them in greater quantities.

When the Vines are in flower, even the frequent sprinkling of the flues and walks in a Hot-house, and the border, &c. in a Vinery, will greatly benefit the Vines. A good heat, however, should be kept up at the same time, as I have constantly experienced that grapes set best in a vaporous heat of between seventy and seventy-five degrees.

In a Hot-house, if the walks, &c. are sprinkled when there is a strong sun, the exhaled moisture will instantly form a kind of artificial dew, which is exceedingly nourishing to the grapes in their infant state.

When strong fires are kept, if the flues are frequently sprinkled with water, the heat of them will cause a steam to arise, which will also have a good effect.

When

When the grapes are grown to the size of small pease, the Vines will require a constant supply of water, till they are full grown. If the border be kept in a moderate moist state during the above period, the Vines will grow luxuriant, and the grapes will swell to a large size^s. But when the grapes are nearly ripe, the waterings should be

^s I have frequently had berries of various kinds of grapes, that have weighed between eight and nine pennyweights each.

I shall here beg leave to remark, that the berries of all the different sorts are not equally ponderous in proportion to their dimensions. Those kinds, which have thick skins, and have flesh of a hard and firm texture, are more weighty than the thin-skinned grapes, with delicate and juicy flesh. From hence we may reasonably infer, that the latter are most easy of digestion, and consequently much more wholesome.

A round thin-skinned berry, which weighs between seven and eight pennyweights, will generally girth about four inches; and one the same weight, of an oval form, about three and a half inches.

Although grapes of the above description may be deemed exceeding large in this country, yet we are informed that they grow to a much larger size in some parts abroad. It is even said, that they are sometimes as large as pigeons eggs.

Two

be less frequent, as too much water at that season would tend to debase their flavour.

When the crop is gathered, the border should be frequently watered till the leaves of the Vines begin to change from green to red and yellow respectively. But from that time,

Two illustrious Travellers*, who have published their observations on the present state of *Asia Minor*, in their journey from *Ephesus* give a curious description of a prospect they enjoyed, for a successive course of hills and mountains extending from thence, and of a beautiful valley at the bottom of them, through which the river *Cayster* flowed and emptied itself into the sea. "Among these, the lofty *Tmolus* rises eminent above the rest; but is more distinguished for the excellence of its wines. At the bottom of the extremest mountain near the sea, several magnificent ruins still remain to be seen of *Sardis*, the metropolis of *Lydia*."

"This delightful country is but thinly inhabited by a few poor *Turks*, and some wandering *Arabs*, and few wines are now made there, but by some Greek Monks, and

* *Ægidius Van Egmont*, Envoy from the States to the King of Naples, and *John Heyman*, Professor of the Oriental languages in the University of Leyden.

time, and during the winter, the border should be kept in a dry state.

I have not at any time found it necessary to water the leaves of Vines growing in the pine-stove, as is by some recommended, except such as have been infested with insects. But during a mild rain, I have frequently let down the upper lights of the Hot-house, that

and chiefly for their own use. Some of these, though made with little art and culture, are light, generous, and very agreeable." But these gentlemen give a different account of a town called *Sidonijah*, which was famous for the goodness of its wines and the quantities made there. "This town is four hours journey distant from *Damascus*, in the extremity of a fertile extended plain, the See of a Bishop, and entirely inhabited by *Greek* christians."

"Some of the grapes here are of a remarkable size, as large as a pigeon's egg, and of a very exquisite taste! Great quantities of them are sent to *Europe*, and known by the name of *Damask* raisins. The wines are not made from this kind of grapes, which are chiefly cultivated in their gardens, but from the Vines of the adjacent mountains, of which *Hermon* and *Lebanon* are nearest." These Gentlemen say, (vol. ii. page 260) that the wine which they drank there was, indeed, incomparable. "The best is made by the Monks, who have there a celebrated convent. It was of a red colour, very generous, grateful, and so light as not to affect the head, though taken freely."

that the Vines at the back wall might reap the benefit of the shower.

There is yet another mode of watering the Vine-border, which is worthy of observation.

During winter, I have frequently watered the Vine-border with a thick black liquor the drainage of dunghills^b; and though this

^b The drainage of dunghills is the very strength and power of the dung; for water constantly filtering through stable-yard dung, certainly robs it of the mucilage and saline particles with which it greatly abounds when newly made; and especially such dung as has lain a considerable time in the stable, and imbibed a large portion of the urine of the horses. The saline particles, contained in new-made dung, are increased by its fermentation, therefore the first extract obtained from the dung, after it has undergone its fermentation, may be justly considered as the cream or essence of the manure.

In most farm-yards this valuable liquor is generally permitted to run to waste, which is much to be regretted, and may, in reality, be deemed a public loss.

The farmer would find his labours well rewarded, by conveying this rich liquor to the most convenient part of his farm, which might easily be done by the help of a water-

this practice was intended solely to enrich the soil, yet it is not improbable but this powerful liquor, by being impregnated with saline particles, may communicate a warmth to the roots of the Vine during the winter, and thereby prove serviceable in that respect also. However that may be, from the uncommon vigour of the Vines at this place, I have been led into a belief of the utility of this practice. But let me at the same time observe, that I have always applied this powerful manure (if I may so call it) with great caution.

water-cart, such as is used to convey water to lay the dust in the streets and roads, about cities and great towns.

Manure is an article of such vast importance in husbandry, that the farmer ought to pay the greatest attention possible to the enlargement of his stock of dung. It is to be wished that it would become a practice to stow the farm, fold, and stable-yards, with leaves of trees, rotten tan, noxious weeds, saw-dust, moory earth, and such like materials. These should be introduced before the dunghil is formed, and should be laid to a considerable thickness in the lowest part of the yard, as they would there receive and imbibe the riches that drain from the dung above.

If this method of proceeding were introduced, many farmers would have an opportunity of collecting materials,
I
whereby

caution. I have found the beginning of winter the most proper time for using this kind of manure ; and then I only venture to give two or three plentiful waterings, fearing that if this were applied either in the spring or the summer, or even in too great quantities, it might tend, from its great power, to cause the leaves of the Vine to change from a green to a yellow hue. I offer this, however, only as a probable speculation, for I don't certainly know that it would produce that effect, though used in summer. It seems,

whereby they might increase their stock of dung to more than twice its usual quantity.

Although soils of different qualities admit of improvement by various modes of practice, yet without the aid of manure, the farmer would find his utmost exertions of but little value. And though some have endeavoured to prove that the earth, when duly pulverized by the action of the plough, does not require manure,* yet experience tells us, that it is the very life and soul of husbandry ; and when judiciously applied on almost every kind of soil, its effect will seldom disappoint the expectation of the farmer.

** Mr. Tull, in his new husbandry, tells us, that where the ground is properly managed, manure is an useless article. But his opinion is now generally and justly exploded.*

seems, however, most reasonable to suppose, that it should be applied when the roots of the Vine are in a state of inaction, as then a winter's rain and frost may, probably, contribute to qualify it, and to incorporate it with the soil.

GRAFTING.

B O O K III.

GRAFTING of Vines is a practice little known in this country, though the advantages resulting from it are many and important.

I shall first endeavour to state some of the most important advantages of grafting Vines, and then lay down the necessary directions for performing the manual operations.

First, when a wall is planted with inferior kinds of Vines, the usual method of stubbing them up, and supplying their places with better sorts, is attended with much expence and loss of time; as in that case it will be necessary to renew the border with fresh compost

post mould, and several years must elapse before the wall can be completely furnished with new Vines ; but by grafting, the nature of the Vines may be changed without expence or loss of time, for I constantly have good grapes from the same year's graft ; and in a Hot-house, the grafts, if permitted, will frequently shoot thirty or forty feet the first summer.

Secondly, in small Vineries, or Vine-frames, where it would be inconvenient at least, if not impossible, in the common way, to have any considerable variety of sorts, they may be procured by grafting different kinds upon one and the same plant. A Syrian Vine, now (1789) growing in a Hot-house at Welbeck, produces sixteen different sorts of grapes.

But what I deem the most important advantage is, the improving the various kinds of grapes, and particularly the small kinds, which generally make weak wood. This may be done, as I have constantly experienced, by grafting the weak and delicate-growing Vines upon the stocks of those that

that have more robust and vigorous stamina^a.

The Syrian Vine is, of all others, the most proper to be used for stocks to graft upon, and plants raised from seed of this sort, are greatly preferable to plants raised either from layers or cuttings. If the seed chance to degenerate to a kind of wilderness, the plants will still be the better for stocks, because they will, on that account, rise with greater vigour^b.

O

It

^a The advantages to be gained by engrafting, have appeared conspicuous in many instances, particularly in the small blue Frontinac, engrafted on the Syrian Vine at Welbeck, which has constantly produced well-sized handsome bunches, with berries almost as large as those of the black Hamburgh.

^b The trees which of themselves advance in air,
Are barren kinds, but strongly built and fair:
Because the vigour of the native earth
Maintains the plant, and makes a manly birth.
Yet these, receiving grafts of other kind,
Or thence transplanted, change their savage mind:
Their wildness lose, and quitting nature's part,
Obey the rules and discipline of art.

VIRG.

It may, perhaps, be imagine^d, that stocks of the above description would tend to debase the flavour of the grapes grafted upon them ; but experience teaches us, that the stock does not impart any such quality to the fruit ; for it is well known that the Golden Pippin, when grafted upon a crab-stock, produces the highest-flavoured fruit.

It has been asserted, that great advantages might, or would result, from grafting the Vine upon the cherry-stock.

Now

“ If a *Vine* be grafted on a common cherry, or any
 “ other kind, the grapes which it produces will be so
 “ remarkably forward, as to be ripe in the season of
 “ cherries. But it is very difficult to graft a *Vine*
 “ well on a cherry-stock, so as to make it thrive and
 “ flourish. The following method has, however,
 “ been generally successful.

“ FIRST, bore a hole with an auger in the trunk of the
 “ cherry-tree ; in this hole insert the scion of the
 “ *Vine*, and let it grow there till it has filled the hole
 “ of the auger, and is closely joined to the cherry-
 “ tree. Then cut off the *Vine*-branch from the *Vine*,
 “ after which it will draw all its nourishment from
 “ the cherry-tree, whose sap will hasten the formation
 “ and

Now though I dare not hazard the recommendation of a method founded on such chimerical principles, I shall be far from prejudicing my readers against any experiments of the sort ; I do not assert that this process cannot succeed, but this I beg leave to suggest, that it would be right for those, who choose to make the trial, not to entertain too sanguine expectations of its success. In a pursuit of this kind, the operator

O 2

would

“ and maturity of the grapes, which will be ripe near
 “ *two months* sooner than ordinary *.

I have, from experience, great reason to believe that the Vine and cherry will not be made to unite and incorporate, even by inarching, which is the most certain of all the ways of grafting ; and much less by the method as set forth above. For the cutting the scion and stock smooth, and fitting them together with exactness, are the first principles in grafting ; whereas boring with an auger will naturally bruise and tear the bark, and must therefore destroy these intentions.

“ The *Certosa* (Carthusians †) stands in a fine air and
 “ pleasant situation, in the midst of vineyards.
 “ They

* *A Treatise on Grafting and Inoculation, (anonymous)*
Salisbury, 8vo, 1780, and sold by Fielding.

† *At Bologna.*

would do well, previously to consider the affinity that ought to subsist between the stock and the scion, as plants will not unite and harmonize from their similar external appearances. It is necessary that the stock and the scion should be both of the same family, or lineage, according to the sexual system of botany, in order to form a substantial and lasting union.

Having

“ They have several courts with cloysters, one as
 “ large as the great court of *Trinity College, Cam-*
 “ *bridge*. Each Father has to his cell a pretty garden,
 “ some of which are very curious, having many ex-
 “ otic plants, &c.

“ One of them had fish in his cistern, which ate lettuce
 “ out of his hands. This Father had tried some ex-
 “ periments in grafting; as of a Vine on a fig-tree,
 “ Jasmine on an orange, which had taken and grew*.
 “ All of them have some employment for their vacant
 “ hours †.

* *This account may serve to pass among monastic legends, but it is too absurd to gain credit with the professional gardener.*

† *Observations made in travelling through France and Italy, &c. by Edward Wright, Esq. vol. ii. page 435.*

Having pointed out some of the principal advantages accruing from engrafting of the Vine, I shall now explain the method of performing the manual operation.

At the pruning season, make choice of cuttings for grafts, or scions, from the best bearing branches of the sorts of Vines intended to be propagated. In general, the bottom part of the last year's shoot is to be preferred; but in well-ripened vigorous wood, any part of the shoot will answer, provided it be not too long-jointed. The cuttings should be preserved in pots till the grafting season, in the manner already described, page 80.

The proper season to graft Vines depends upon their situation. Vines in a Pine-stove should be grafted in the beginning of January, but the middle of March is a proper season to graft Vines growing in the open air. In general, Vines should be grafted about three weeks before they begin to break into bud.

Upon small stocks, not more than one inch in diameter, cleft-grafting will be found the

the most proper ; but upon larger stocks, whip-grafting is to be preferred.

In both methods, much care should be taken in fitting the stock and scion together, and the operation should be performed with great exactness.

When the stock and scion are well fitted, the graft should be fastened with the strands of bafs-matting, and should then be covered with clay in the usual way.

Vines do not harmonize with so much freedom as commoner fruit ; for though the scion will sometimes begin to push in a few weeks, yet it will frequently remain in a dormant state for two or three months ; and during this period it will be necessary to strip the stock of all the shoots it may produce as soon as they appear ; and, in order to preserve the scion in a vegetative state, it will be absolutely necessary to keep the clay moderately moist, which may easily be effected by wrapping it round with moistened moss, and keeping the moss constantly sprinkled with water.

When

When the scion has made shoots five or six inches long, the clay and bandage should be carefully taken off; and the clay may be removed, without injuring the graft, when it is in a moist state.

Vines will frequently prove successful by both the above-mentioned methods, but still the most eligible way of all seems to me to be that of grafting by approach: Indeed I have seldom known any plants miscarry, that have been grafted this way. Now in this case it is necessary to have the plant, intended to be propagated, growing in a pot. Strong plants, that have been two or three years in pots, are to be preferred; but plants from the nursery may be potted, and grafted in the same season, if brought into a Hot-house or Vinery; for the great warmth of either will generally cause plants, brought out of the open air, to push with vigour, and to form new roots, which will support the plant, and greatly facilitate its forming an union with the stock,

I have constantly had fine grapes, and the grafts have made good wood, the first season, by every method of grafting, but particularly

particularly by the last. In which it is obvious that the graft has a double support, viz. from the stick, as well as from the plant in the pot.

In this method it will be necessary to let the clay and bandage remain two or three months after the graft has formed an union; for if taken off at an earlier period, the grafted part of the plant will be very liable to spring from the stock.

The pot should be plentifully supplied with water till the month of August, when the graft should be separated from the plant in the pot. Two or three inches of wood below the bottom of the graft may be left, but should be taken clean off at the next winter's pruning.

I have constantly had fine grapes, and the grafts have made good wood, the first season, by every method of grafting, but particularly

ON THE DIFFERENT

SPECIES OF INSECTS

THAT INFEST THE

VINE;

WITH PROPER METHODS OF DESTROYING OR
PREVENTING THEM.

ALTHOUGH the Vine is not very liable to be infested with insects when growing in the open air in this country^d, yet few plants suffer more from their ravages than Vines under glass, especially those growing in Pine-stoves.

The

^d I believe the vineyards abroad are not generally subject to be infested with insects: We are informed, however, that there have been instances where the Vines have been so greatly injured, as to cause a considerable decrease in the produce of the vintage. This I presume only happens in

dry

~~The constant warmth kept in Hot-houses~~ during winter, serves to preserve the succession of various destructive insects from one season to another.—I shall here mention the several sorts with which the Vine is liable to be infested, and then prescribe the proper methods for destroying or preventing them.

1. The *Acarus*, commonly called the Red Spider. This species is, doubtless, the most pernicious ;

dry summers, and in the countries that lie near the tropics,

“ The isle of Pico has its name from the peak or high
 “ mountain upon it. This island is not only the larg-
 “ est, but also the most populous of the Azores,
 “ containing 30,000 inhabitants. It has no corn
 “ fields, being every where covered with vineyards,
 “ which have a most enchanting appearance on the
 “ easy slope at the foot of the mountain. The season
 “ of vintage is the season of mirth and festivity, when a
 “ fourth, or even a third part of the inhabitants of
 “ Fyal, remove to Pico with their families, down to
 “ their smallest domestic animals. It is affirmed that
 “ a quantity of grapes, which would yield three
 “ thousand pipes of wine, are eaten at that time ;
 “ every person indulging his taste with this delicious
 “ fruit, though no people are more sober and frugal
 “ at their meals than the Portuguese. Formerly the
 “ vintage produced annually 30,000, and sometimes
 “ in

pernicious ; and as fire-heat greatly encourages its increase, it generally abounds in most Hot-houses.

The Acari frequently attack the leaves of the Vine early in the summer, and as their increase in dry weather is amazingly quick and great, they will, without some method of controul, soon greatly endamage, and, in time, totally destroy the foliage.

They
 “ in fortunate years 37,000 pipes of wine ; but a
 “ kind of disease attacked the Vines some years ago,
 “ which caused the leaves to drop off at the time
 “ when the grapes require to be sheltered from the
 “ sun : I suspect this to be caused by some species
 “ of insect.”

Forster's Voyage, vol. 2, page 597.

“ In Spain, the season of making wine is looked upon
 “ as a time of great festivity, and celebrated with rejoicings that border on licentiousness. While the
 “ vintage continues, all distinction and respect is
 “ forgot : The owner of the vineyard puts aside his
 “ austerity with his cloak, and cries out to his servants, “ Let us be merry, my companions, wisdom
 “ is fled out of the window.” A custom that
 “ has been preserved in this country ever since the
 “ Romans set foot in it.”

Carter's Journey from Gibraltar to Malaga,
 vol. ii. page 397.

They generally reside and breed on the under-side of the leaves, and the infested leaves are very distinguishable as soon as they are attacked by them, for the insect wounds the fine capillary vessels with its proboscis, and this causes the upper surface of the leaf to appear full of very small dots, or spots of a light colour. When the Acari are very numerous, they work a fine web over the whole under-side of the leaf, as also round the edges thereof; and it is curious enough to observe, that they commonly carry this web in a straight line, from one angular point of the leaf to another, on which boundary line, in a warm day, they pass and repass in very great numbers.

The Acari, however, do not confine themselves to the leaves only, but attack the bunches of grapes also, especially at the time when they are almost ripe; and as they extract the juices from them, the grapes soon become soft, flabby, and ill-flavoured.

2. The Thrips. This species abounds in most Hot-houses, and is hurtful to most plants kept in them. It is often injurious to Vines growing there; and, as I have observed,

served, more particularly so to the sorts that produce white berries.

This species, however, is not confined to the Hot-house only, but is commonly found upon plants growing in the open air, as also upon flowers : These insects are often very numerous upon the flowers of pinks and carnations.

The Thrips sometimes attack the young shoots of Vines growing in the open air, especially those of weak Vines, or Vines newly planted.

If young shoots chance to receive any injury by late spring frost, the tender part of the leaf will immediately curl up, and change to a dark-brown colour ; and in this state the Thrips generally attack them with great greediness, especially the white Sweetwater and white Muscadine kinds. These sorts are generally planted against common walls.

The Thrips, however, are seldom injurious to Vines growing in the open air, except in the spring ; and to those in the Hot-house they are most hurtful when the grapes are
nearly

nearly ripe. They attack the bunches as well as the leaves, and commonly prey upon the extremities of the berries, but more particularly at the end next the foot-stalk. In white grapes, the part of the berry injured changes to a dark colour, the foot-stalk turns black, and the berry withers.

3. The Aphis. The Aphides are, I believe, the most numerous of all the insect tribe. This species infests the brawny oak, as well as the minutest weed. What are called honey dews in the summer, are occasioned by this species of insect. The young shoots of Vines are sometimes infested with the Aphides; but as Vines generally grow exceedingly rapid, these insects do not often greatly injure them.

4. There are two or three kinds of Cocci that sometimes infest the Vine, viz. The Coccus Hesperidum, and the Coccus Adonidum. But as such instances rarely occur, and these insects are not very prejudicial to the Vine, I shall pass over them with only observing, that the latter of these are sometimes mistaken for the crimson-tinged Pine-bug. These often abound, both in Hot-houses

houses and Conservatories, and breed upon many kinds of plants kept in them, such as the coffee-tree, the oleander, &c.

Having mentioned the several species of insects with which the Vine is liable to be infected, I shall now lay down the proper methods for destroying them.

All the foregoing species of insects, the *Acarus* excepted, may be destroyed by a strong fumigation of tobacco.

The method of fumigating Hot-houses, &c. either by the bellows or by the smoaking-pot, being now generally understood, it is unnecessary to say much upon this head; I shall therefore only beg leave to subjoin the following observations:

1st. It would be improper to fumigate either Vinery or Pine-stove, where there are Vines late in the spring, or in the summer, because the smoak would injure the grapes, by giving them a disagreeable flavour.

2dly. When either a Hot-house or Vinery is infested with any of the above-mentioned insects,

224 DIFFERENT SPECIES OF INSECTS

insects, or when they may have been very numerous the preceding season, it will be necessary to destroy them effectually, before the Vines come into flower; and this may be done by fumigating two or three different times, at the distance of three or four days between each operation.

Pine-stoves are much more liable to be infested with these insects, than either Grape-houses or Vineries, because in the latter it is usual to take off the glass-frames during the winter, by which means the insects generally perish: But the warmth of pine-stoves serves to protect the insects through the winter, as I have already observed.

In Pine stoves, the Thrips are often greatly encouraged by many kinds of vegetables kept there, and particularly by kidney-beans. The increase of the insect upon this plant in the spring is so exceedingly rapid, that it is not unusual to see whole crops of this plant entirely destroyed by them: In order, therefore, to prevent the increase of these insects, it will be expedient, after the stove has been fumigated, first to remove all such plants as encourage them; then to sow a fresh crop of kidney-

kidney-beans in pots immediately, and these should be placed all over the flues, &c. so that in case any insects should have escaped the fumigation, the young bean plants may attract them; and as soon as these plants appear to be infested, take them away, and sow a fresh crop for the same purpose.

Of all the insect tribe the Acari are the most pernicious, and particularly so to Vines growing in Pine-stoves. Indeed they often prove fatal to them.

Before I had discovered an effectual method of destroying them, it used to grieve me much to see the Vines often in a languishing state from these insects; and as I still frequently see Vines growing in Pine-stoves in the same predicament, I flatter myself that what I have now to offer on this head will not be deemed the most unacceptable, or least useful, part of this work. For I can assure my readers, that I have, by many years experience, found the following method efficacious and satisfactory in every respect:

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To one pound of flowers of sulphur put two ounces of common scotch stuff; (very good tobacco dust will answer equally well). Let these be well mixed together; then take a small brush, such as is used for common paintings, dip it lightly in the sulphur, then lay one hand on the upper surface of the leaf, and with the other draw the brush very gently backwards and forwards all over the under side. By this means a little sulphur will be left on the leaf. The *Acarus* being soft and delicate in its nature, is hereby destroyed with the most gentle touch: The brush also most readily wipes off their web as well as their globular transparent eggs, which are by a fine membrane fastened to the leaves; and thus we are secured from the danger of a succeeding brood.

This process may to some have the appearance of a tedious operation; and indeed, when Vines are injudiciously trained, it certainly must be attended with great trouble; but it is very easily performed upon Vines trained in the regular method here set forth; and a single operation is generally sufficient for a whole season.

I have

I have commonly given a general dressing to the Vines in the Pine-stove at Welbeck, as soon as I have observed the Acari make their appearance upon any part of them; and I have seldom found it needful to repeat the operation during the summer.

I shall just beg to observe, that sulphur alone is sufficient for the above purpose; but the small quantity of snuff recommended to be used along with it, renders the mixture equally powerful and fatal to the Thrips also, and therefore the more advisable.

I have commonly given a general direction to the Vines in the Pine Grove at Welbeck, as soon as I have observed the Acanth marks their appearance upon any part of them, and I have seldom found it needful to repeat the operation during the summer.

I shall just beg to observe, that sulphur alone is sufficient for the above purpose; but the small quantity of manure recommended by the author along with it renders the mixture equally powerful and fatal to the Thrips also, and therefore the more advisable. I have never seen the Thrips appear again after the mixture has been applied, and I have seen the Thrips appear again after the mixture has been applied.

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P. 2

ON THE
AGE AND STATURE OF THE VINE;
AND OF THE
DURABILITY OF VITIGINOUS WOOD.

THERE is no part of the History of the Vine so astonishing as that of its age and stature: Of all the various kinds of fruit-bearing trees that endure the climate of this island, the Vine is the most unlikely to exceed in either of these particulars. Without the assistance of man, and the aid and support of some other tree, the Vine certainly would be of a very humble growth^e; for

* " Grapes are not only spontaneous in *Carolina*, but in
" all the Northern parts of *America*, from the lati-
" tude of 25 to 45 ; the woods are so abundantly re-
" plenished with them, that in some places, for many
" miles together, they cover the ground, and are an
" impediment

for indeed the idea one forms of a Vine-tree, in its rude and natural state, is extremely similar to that of a large bramble-bush;

“impediment to travellers, by entangling their horses
 “feet with their trailing branches; and lofty trees
 “are over-top’d and wholly obscured by their em-
 “braces. From which indications one would con-
 “clude, that these countries are as much adapted for
 “the culture of the Vine as *Spain* and *Italy*, which lie in
 “the same latitude. Yet by the efforts that have
 “been hitherto made in *Virginia* and *Carolina*, it is
 “apparent that they are not blessed with that clemen-
 “cy of climate, or aptitude for making wine, as the
 “parallel parts of Europe, where the seasons are
 “more equal, and the spring not subject, as in *Caro-*
 “*lina*, to the vicissitudes of weather, and alternate
 “changes of warm and cold, which, by turns, both
 “checks and agitates the rising sap, by which the ten-
 “der shoots are often cut off. Add to this the ill
 “effects they are liable to by too much wet, which
 “frequently happening at the time of ripening, occa-
 “sions the rotting and bursting of the fruit.

“Though the natural causes of these impediments may
 “not presently be accounted for, yet it is to be
 “hoped that time and an assiduous application will
 “obviate these inclement obstructions, of so benefi-
 “cial a manufacture as the making of wine may
 “prove.”

Catesby's Natural History of Carolina, vol. i. p. 22.

but yet, by care and proper cultivation, we find it sometimes arrive to a large bulk, and, in point of longevity, to vie even with the venerable oak. Many kinds of fruit-trees, and even some that rise to a competent size, much resembling timber, are, nevertheless,

Although the Vine makes but a mean and despicable appearance in its rude and natural state, yet scarcely any plant surpasses it in elegance and beauty when trained by art.

Vines judiciously propagated against a wall have a most pleasing appearance; and if trained, as often is practised on the roof of the Hot-house, &c. and the different kinds of grapes (with their various-coloured berries) are intermixed with propriety, there is a wonderful richness and beauty at the time when the fruit is near ripe. But the method of training Vines, in the manner of festoons, as practised in some parts of Spain and Italy, affords a scene superb almost beyond the powers of description.

“ I walked leisurely the best part from *Molin de Reys* to
 “ this town *, with a prospect sufficiently fine all
 “ around me, to put any body in mind of the Elysian
 “ fields. It consisted of an endless continuation of
 “ Vines, supported by mulberry-trees regularly
 “ planted, the Vine-branches so disposed as to form
 “ rich festoons from one tree to another. I have seen
 “ such

* *Barcelona.*

theless, exceedingly short lived ; so that though some few of the mulberry-trees planted in the reign of King James the First, may be yet in a fruit-bearing state, and also some of the fig-trees at Lambeth palace, thought coeval with Archbishop Laud, yet these are no impeachment of the truth of the

“ such festooned Vineyards in some parts of Italy,
 “ especially in the duchies of Mantua and Modena,
 “ with this only difference from the Catalonian fashion,
 “ that instead of Mulberry-trees, the Modenese and
 “ Mantuan Vines are supported by elms.

“ Think how rich the Catalonian Soil must be, that affords nourishment not only to those Vines and mulberry-trees, but also to the wheat that is sown under their shade † ! Nay, there are vineyards in this country in which, after the corn-crop, they get another

† Mr. Swinburne, in his *Travels through Spain*, says,
 “ Their vintages are commonly very plentiful. This autumn, 1775, there was such a superabundance of grapes in the valley of Talarn, in the neighbourhood of Pallas, that whole vineyards were left untouched, for want of vessels to make or hold the wine in. Notice was posted upon the church doors, that any one was at liberty to take away what quantity he pleased, on paying a small acknowledgment to the proprietors. The best red wine of Catalonia is made at Mataw, north of Barcelona, and the best white at Sitges, between that city and Tarragona.” Page 65.

the observation, since it is no uncommon thing for men to see trees running into apparent decay, which their own hands have raised and planted : It consequently is a circumstance most remarkable, relative to the Vine, that it is of such a lasting duration as to survive many ages.

Mr.

“ other of some other grain. What a delightful object to the eyes of the honest husbandman, to see so much fertility come thus forth to reward his well-spent labours !”

Baretti's Travels, vol. iv. page 73.

It is much to be regretted that Mr. Baretti did not investigate and describe the soil which is said to be thus prolific. The festoon vineyards in Lombardy are not less elegant than the above, although the Vines are there trained somewhat differently. A celebrated Author has thus described them :

“ The country of *Lombardy* is perfectly flat, a rich soil, fine pastures and corn-fields, abundance of Vines, and white mulberry-trees for the silk-worms, the Vines running up the branches. This country is the finest we saw in *Italy*, unless you'll except the *Campagna Felice* about *Naples*.

“ We observed few timber-trees, only Elms and Poplars, which support the Vine-branches, as I observed before,

no Mr. Miller, in his *Gardener's Dictionary*, tells us that the vineyards in some parts of Italy will hold good above 300 years, not counting those of 100 years as young Vines.

Astonishing

“ before, of the mulberry-trees. The roads are very
 “ broad and even, and most pleasant travelling in the
 “ summer; but some of them deep enough in the
 “ winter: The hedges by the road side are many of
 “ them cut, and managed with a great deal of exact-
 “ nefs. The Vines run up the bodies of the trees,
 “ and intermix themselves with their branches (*alias*
 “ *maritant populos*); and the extremities are drawn
 “ out from tree to tree, and hang in festoons between
 “ them along the road hedges. From those hedges
 “ there go rows of trees along the grounds, at about
 “ forty or fifty yards distance from each other; the
 “ Vines all running up their bodies. And here,
 “ besides the festoons hanging from tree to tree, the
 “ Vine-branches are extended right and left, and
 “ fastened to a row of stakes on each side, which run
 “ parallel to the trees: And these stakes are as so
 “ many pillars, supporting a sort of pent-house, or
 “ oblique roof, which is formed by the Vine-branches
 “ on each side of the trees. Thus are the grounds
 “ disposed and planted on both sides the road, and the
 “ trees with the Vines managed in this sort of natural
 “ architecture, generally speaking, all over *Lom-*
 “ *bardy*.”

Astonishing as the above account, respecting the Age of the Vine, may appear at first sight, the wonder will, in a great measure, cease, when we compare it with the following passage taken from Mr. Evelyn's *Silva*, in which that of its bulk will not seem less surprizing.

“ The particulars were too long to recount
 “ of the old *Platanus* set by *Agamemnon*,
 “ mentioned by *Theophrastus*, the Herculean
 “ Oaks, the Laurel near *Hippocrene*, the
 “ Vatican *Ilex*, and the Vine which was
 “ grown to that bulk and woodiness, as to
 “ make a statue of *Jupiter*, and columns in
 “ *Juno's* temple : At present it is found that
 “ the great doors of the cathedral at *Ravenna*,
 “ are made of such Vine-tree planks, some
 “ of which are twelve feet long and fifteen
 “ inches broad, the whole soil of that country
 “ producing Vines of a prodigious
 “ growth.

“ Such another in *Margiana* is spoken of
 “ by *Strabo*, that was twelve feet in circumference. *Pliny* mentions one of six hundred
 “ years old in his time ; and at *Ecoan*, the
 “ late Duke of *Montmorancy's* house, is a
 “ table

“ table of a very large dimension, made of
 “ the like plant; and that which renders it
 “ the more strange is, that a tree growing in
 “ such a wreathed and twisted manner, rather
 “ like a rope than timber, and needing the sup-
 “ port of others, should arrive to such a bulk
 “ and firm consistence; but so it is, and *Olearius*
 “ affirms, that he found many Vines near
 “ the *Caspian* sea, whose trunks were as big
 “ about as a man.”

“ *Pliny*, speaking of the Vine, says, The
 “ ancients very justly reckoned Vines among
 “ trees, on account of their magnitude. We
 “ see now an image of Jupiter at *Populonium**,
 “ made out of one†, and incorrupted after so
 “ many ages. Also a *Patera*‡, at *Massilia* §.
 “ At *Metapontum* ||, the Temple of *Juno*,
 “ was supported by vineal columns. And
 “ even now, as reported, the roof of the
 “ Temple of *Diana* at *Ephesus* is ascended by
 “ ladders, made of one *Cyprian* Vine, for in
 “ Cyprus they grow up to an extraordinary
 “ size.

* A city of Italy.—† A single Stock only.—‡ Sawed
 across, we must suppose, and not longitudinally.—§ Mar-
 seilles.—|| Metapontum is in Calabria.

“size. No wood is of a more lasting nature.” *Lib. xiv. chap. 1.*

The Naturalist observes afterwards, and very sensibly, that the above particulars are to be understood of Vines in their rude and uncultivated state, since by pruning and dressing, the vigour of the stock is distributed and transfused into the branches.

I have been informed that there are, upon the Barbary coast, Vines now growing of surprising dimensions, some of them having trunks eight or nine feet in circumference. If the age of these could be ascertained, it would, no doubt, be found equally astonishing. We are not informed whether it be any particular kind of Vine that grows to this amazing size, or whether the size ought not to be attributed to the genius of the soil and air of that country.

We cannot possibly expect such surprising instances of antiquity in this country, on account of the unfavourableness of our climate from the Northern situation of the island.

Indeed we learn from history that grapes," as well as most other sorts of fruit," were brought, by slow degrees, into the Western parts of Europe, and principally from Asia and Egypt⁵¹.

The
 "In the more remote ages of antiquity, the world
 "was unequally divided. The East was in the imme-
 "morial possession of arts and luxury, whilst the
 "West was inhabited by rude and warlike barbarians,
 "who either disdained agriculture, or to whom it
 "was totally unknown. Under the protection of an
 "established government, the productions of happier
 "climates, and the industry of more civilized nations,
 "were gradually introduced into the Western coun-
 "tries of Europe, and the natives were encouraged,
 "by an open and profitable commerce, to multiply the
 "former, as well as improve the latter. It would be
 "almost impossible to enumerate all the articles, either
 "of the animal or vegetable reign, which were suc-
 "cessively imported into Europe from Asia and
 "Egypt^{*}; but it will not be unworthy of the dig-
 "nity, and much less of the utility of an historical
 "work, slightly to touch on a few of the principal
 "heads,

* It is not improbable that the Greeks and Phœnicians introduced some new arts and productions into the neighbourhood of Marseilles and Gades.

The Vine, however, when planted in a soil it delights in, will grow to an amazing size and expansion, even in this country. I shall beg leave here to produce two or three instances

“ 1st. Almost all the flowers, the herbs, and the fruits, that grow in our European gardens, are of foreign extraction, which, in many cases, is betrayed, even by their names: The apple was a native of Italy, and when the Romans had tasted the richer flavour of the apricot, the peach, the pomegranate, the citron, and the orange, they contented themselves with applying to all these new fruits the common denomination of *apple*, discriminating them from each by the additional epithet of their country.

“ 2d. In the time of Homer, the Vine grew wild in the island of Sicily, and, probably, in the adjacent continent; but it was not improved by skill, nor did it afford a liquor grateful to the taste of the savage inhabitants*. A thousand years afterwards, Italy could boast, that of the fourscore most generous and celebrated wines, more than two thirds were produced from her own soil†. The blessing was soon communicated to the Narbonne province of Gaul; but so intense was the cold to the North of Cevennes, that, in the time of Strabo, it was thought impossible

* See Homer *Odyss.* Lib. xiv. ver. 358.

† *Plin. Hist. Natur.* Lib. xiv.

instances of Vines covering a surprising area of walling.

At Northallerton in Yorkshire, there is a Vine now (1789) growing, that once covered a space

“possible to ripen the grapes in those parts of Gaul*.

“This difficulty, however, was gradually van-
quished; and there is some reason to believe, that
“the vineyards of Burgundy are as old as the age of
“the Antonines †.

“3d. The Olive, in the Western world, was the com-
panion as well as the symbol of peace. Two cen-
turies after the foundation of Rome, both Italy
and Africa were strangers to that useful plant; it
was naturalized in those countries, and at length
carried into the heart of Spain and Gaul. The
timid errors of the ancients, that it required a cer-
tain degree of heat, and could only flourish in the
neighbourhood

“Strab. Geograph. lib. iv. p. 223. The intense cold of a
Gallic winter was almost proverbial among the ancients.

† In the beginning of the fourth century, the orator Eume-
nius (Panegyric. veter. viii. 6th edit. Delphin.) speaks of the
Vines in the territory of Autun, which were decayed through
age, and the first plantation of which was totally unknown.
The Pagus Arobrignus is supposed by M. Danville, to be the
district of Beaune, celebrated even at present for one of the
first growths of Burgundy.

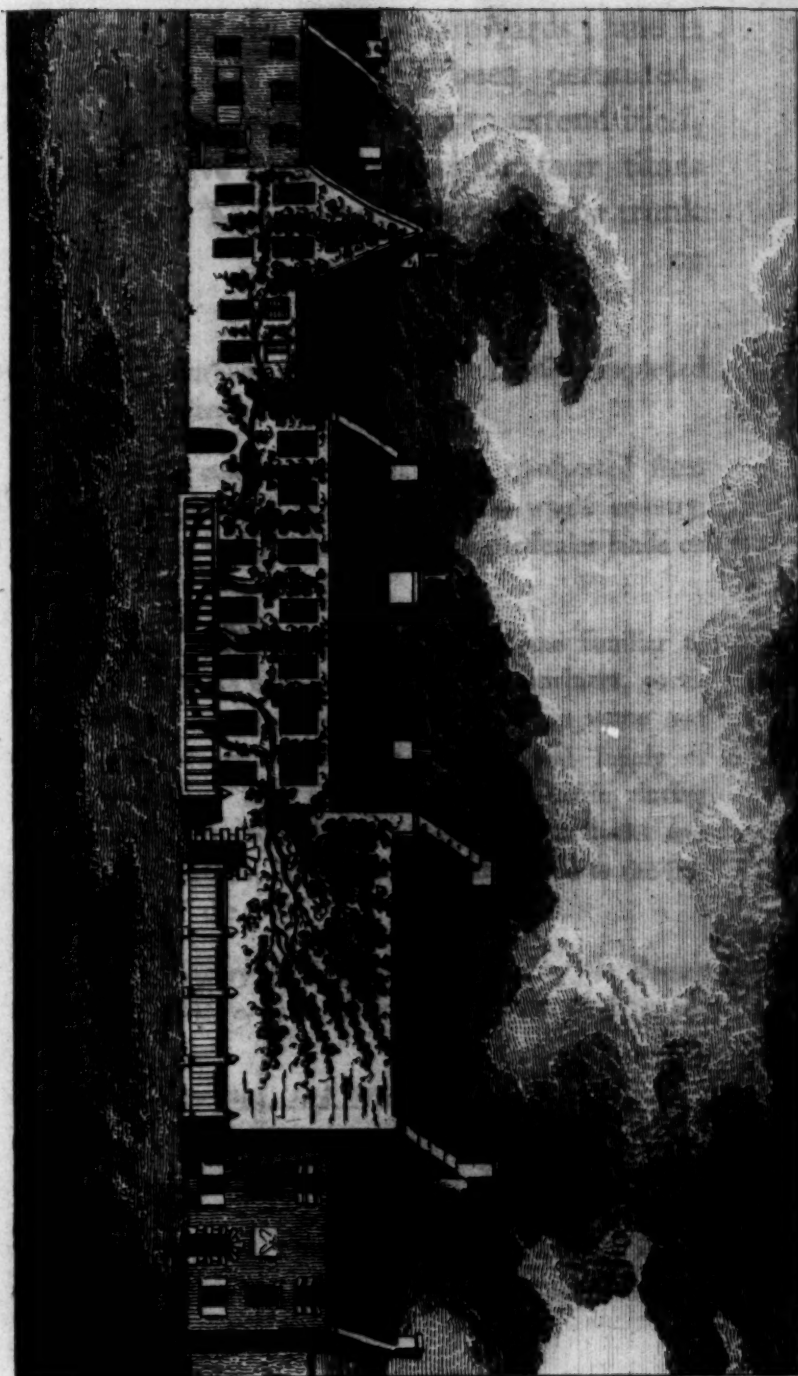
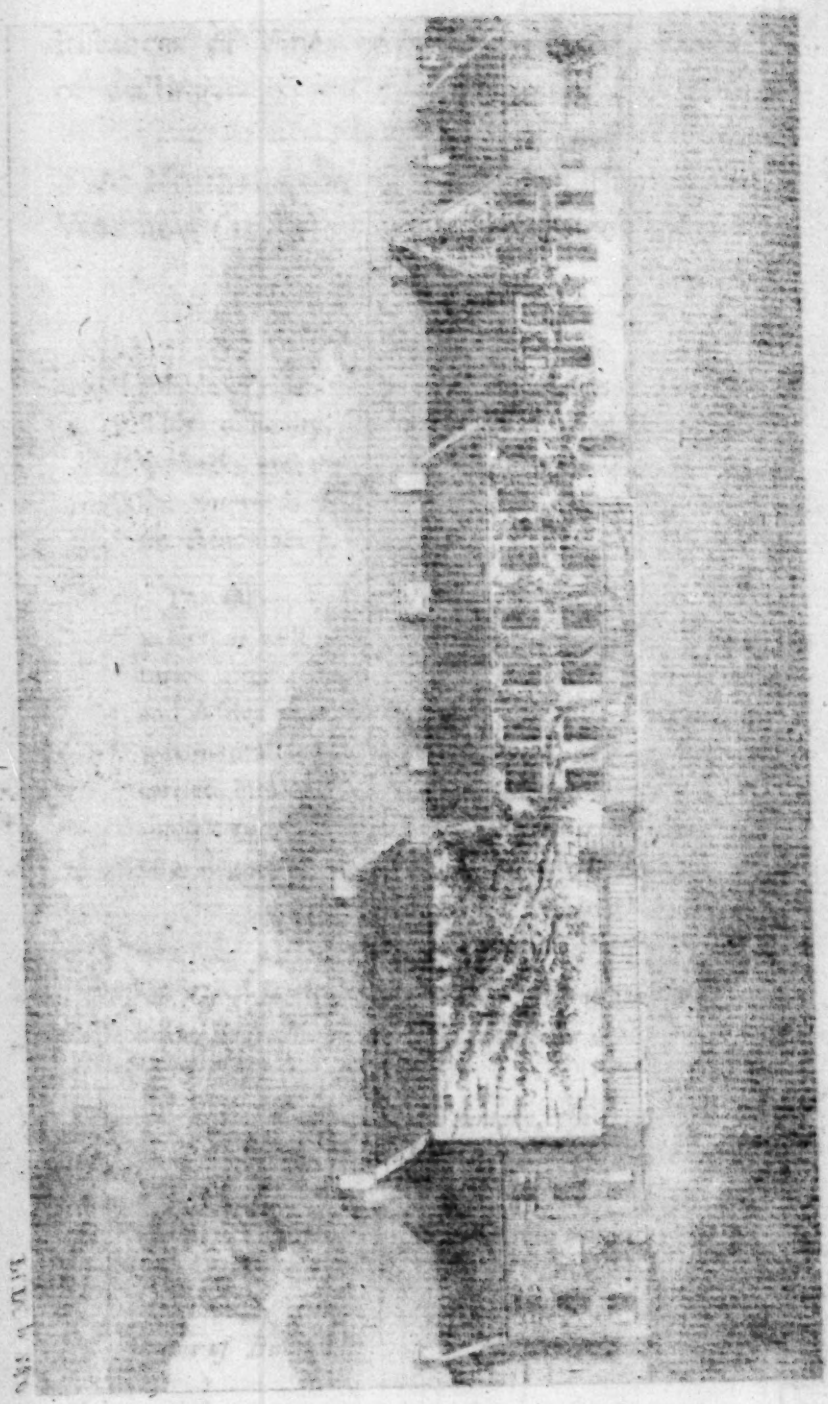


PLATE P. 240

A REMARKABLE VINE GROWING AT NORTHALLERTON.



1890

a space containing 137 square yards ; and it is judged, that if it had been permitted, when in its greatest vigour, to extend itself, it might have covered three or four times that area. The circumference of the trunk

or

" neighbourhood of the sea, were insensibly exploded
" by industry and experience *.

" 4th. The cultivation of flax was transported from
" Egypt to Gaul, and enriched the whole country,
" however it might impoverish the particular lands on
" which it was sown †.

" 5th. The use of artificial grasses became familiar to
" the farmers both of Italy and the provinces, particularly the Lucerne, which derived its name and
" origin from Medina †. The assured supply of
" wholesome and plentiful food for cattle during
" winter, multiplied the number of the flocks and
" herds, which, in their turn, contributed to the fertility of the soil."

The History of the Decline and Fall of the Roman Empire, by E. Gibbon, Esq. vol. 1. ch. ii. p. 52.

* *Plin. Hist. Natur. lib. xv.*

† *Plin. Hist. Natur. lib. xix.*

† See the *Agreeable Essays on Agriculture, by Mr. Harte, in which he collected all that the ancients and moderns have said of Lucerne.*

or stem, a little above the surface of the ground, is three feet eleven inches. It is supposed to have been planted 150 years ago ; but from its great age, and from an injudicious management, it is now, and has long been, in a very declining state.

There are many other Vines growing at Northallerton, which are remarkable for their size and vigour.

The soil is light and rich, of a dark colour, and inclining to sand.

At Valentine, near Ilford in Essex, the seat of the late Sir Charles Raymond, Bart. there is a Vine now growing, whose branches extend and furnish the entire roof of a Pine-stove, which is seventy feet long by eighty feet broad. And moreover, some of the branches are trained downwards, and also cover great part of the back wall of the said building.—The Vine, which is the Black Hamburgh, was planted in the year 1758, and grows entirely in the inside of the stove. The girth of the main stem, at two feet from the ground, is about thirteen inches.

The

The gardener informed me, that for some years past he, upon an average, has made about one hundred pounds per ann. of the produce of this tree. But at the time I saw it in the year 1788, (and just before the grapes were ripe) the crop was so very moderate, that had the whole been sold at the high price of five shillings per lb. it could not possibly have made a sum equal to half that amount. The bunches, however, in general, were singularly fine, and composed of large and well-swelled berries.

This extensive Vine was exceedingly robust, and under a very judicious management. The worthy gardener that planted it has, from that time, had it entirely under his own care.

My esteemed and learned friend, the Rev. Mr. Philip Lawrents, Head-Master of the school at Bury in Suffolk, has favoured me with the following elegant and surprising account of a Vine now growing there :

January, 6, 1786.

“ If credit may be given to our gardeners,
“ the nature of our *Bury* soil is particularly

Q 2

“ favourable

“favourable to the *gooseberry*, the *pear*, and
“the *Vine*. By all these, but especially by the
“produce of the *Vine*, my neighbour
“*Gervase Coe* is getting money very fast.
“One *Vine*, which he calls the *Black Cluster*,
“covers forty-four yards in length, of a
“wall ten feet high. Some of the branches
“have been suffered to run over the wall,
“and cover about twelve yards more in
“length on the other side. This extensive
“plant is about five or six and thirty years
“old. But this is no *datum* by which we
“must calculate the proportion of its annual
“growth, for, during near half the time of
“its existence, it was, by its proximity to
“places unfit to receive its branches, con-
“fined within very narrow limits, and to
“judge from its progress within these last
“seven or eight years, it might, if it had
“been permitted, have covered three or
“four times the *area* of wall which it does
“at present.

“That part of the wall, against which this
“*Vine* was first trained, has a South aspect.
“But three-fourths of the walling which it
“now covers face the East, and the twelve
“yards over the wall the West.

“As

“ As no wine is ever made of the whole
 “ produce of it, and indeed none, except in
 “ very backward autumns, the owner cannot
 “ guess at the quantity of juice which it
 “ might yield. The clusters or bunches
 “ hang very thick, and each weighs from
 “ half a pound to a pound.

“ The public papers having lately taken
 “ notice of the prolific excellence of foreign
 “ Vines, numbering sometimes forty clusters
 “ on one shoot, I was tempted to examine
 “ my neighbour's Vine, and upon some vi-
 “ gorous shoots which had been left with
 “ nine or ten eyes or gems, to fill up vacant
 “ places, I reckoned above forty clusters.
 “ This will serve to give you some idea of
 “ this wonderful tree. At the height of one
 “ foot and a half from the ground, the
 “ trunk is only eight inches in circumfe-
 “ rence: Below that pitch are some irregu-
 “ lar protuberances, which it would be un-
 “ fair to ground any calculations upon ;
 “ however, not to keep back any thing
 “ which tends to information, the circum-
 “ ferences, where those protuberances are
 “ the fullest, I have measured, and find to
 “ be thirteen inches. From this swollen part
 “ issue

“ issue some trifling shoots, and belonging to
“ it are small stumps of other shoots, for-
“ merly cut down, which seem to have oc-
“ casioned the irregularity here mentioned.
“ Still lower, and within an inch or two of
“ the ground, the stem girts but between
“ nine or ten inches ; finally, close to the
“ ground, the stem girts but between nine or
“ ten inches ; finally, close to the ground
“ are three or four divaricating branches of
“ a very moderate size, which furnish the
“ wall with somewhat more than a fourth of
“ its foliage ; so that by the trunk girt-
“ ing eight inches, is meant the main
“ trunk.

“ The Vine has been pruned some weeks :
“ The number of eyes left upon this year’s
“ shoots is various in proportion not only to
“ the vigour of the shoot, but of the space
“ also to be filled up.—In most places, from
“ three to five eyes is the general standard ;
“ but there are many shoots with from eight
“ to ten eyes left upon them ; and at the
“ extremities of the Vine, as much of the
“ wood as was perfectly ripe has been left.—
“ In this part you have shoots with eighteen,
“ some with twenty-two eyes. Each of these
“ (if

“ (if one may judge from preceding years)
 “ will throw out a shoot, bearing, upon an
 “ average, of the shoots in the whole Vine,
 “ two clusters and a half ; for the gardener
 “ assures me that the clusters are from one
 “ to four on a shoot. Please to observe like-
 “ wise, that each shoot on that of the pre-
 “ ceding year, which had numerous eyes
 “ left on, is no less prolific than the shoots
 “ of a smaller fraternity. Had the Vine
 “ been always pruned in this manner, and
 “ allowed to expand itself, (as it has been
 “ suffered to do these three or four years
 “ past in particular) it is incredible what
 “ surface the main stem might have sufficed
 “ to cover.

“ The soil is a light, loose, brownish
 “ mould, lying about two feet thick on a
 “ loose sand, with coarse gravel, and at the
 “ depth of twenty feet you come to the
 “ water.”

to cover

"The soil is a light, loamy, brownish
mould, from about two feet thick on a
loose sand, with coarse gravel, and at the
depth of twenty feet you come to the

ON
VINEYARDS.

B O O K IV.

A Treatise on the Culture of the Vine would be incomplete and deficient, was I to omit giving some account of the formation and progress of a Vineyard; and especially in a country of which a part is within the vinous latitude^a.

Vineyards

^a The vinous latitude is said to extend between the 25th and 51st degree in the Northern Hemisphere.

It is found, by experience, that all the Vineyards in *Germany*, situated within the 51st degree, are cultivated with great advantage; but beyond that limit their success is dubious.

I must here beg to remark, that the climate is various in different countries, even under the same parallel of latitude. Also, that the seasons are much more favourable in *Germany*, *Prussia*, *Poland*, *Hungary*, &c. than under the same latitude in the parallel parts of *America*. And, moreover, that the seasons in *Europe* were much colder formerly than at present. A celebrated Author has thus accounted for this phenomenon.

“ Some

Vineyards are of very ancient date,
and

“ Some ingenious writers * have suspected that Europe
“ was much colder formerly than it is at present ;
“ and the most ancient descriptions of the climate of
“ Germany tend exceedingly to confirm their theory.
“ The general complaints of intense frost and eternal
“ winter, are, perhaps, little to be regarded, since
“ we have no method of reducing to the accurate
“ standard of the thermometer, the feelings or the
“ expressions of an orator born in the happier regions
“ of Greece or Asia. But I shall select two strong
“ and incontestable proofs of a less equivocal nature.

“ 1st. The great rivers which covered the Roman pro-
“ vinces, the Rhine and the Danube, were frequently
“ frozen over, and capable of supporting the most
“ enormous weights. The Barbarians, who often
“ chose that severe season for their inroads, trans-
“ ported, without apprehension or danger, their nu-
“ merous armies, their cavalry, and their heavy
“ waggons, over a vast and solid bridge of ice †.
“ Modern

* In particular, Mr. Hume, the Abbé du Bos, and M. Pellontier, *Hist. des Celtes*, tom. i.

† Diodorus Siculus, lib. v. p. 349. Edit. Weffel. Herodian, lib. vi. p. 221. Jornandes, chap. 55. On the banks of the Danube, the wine, when brought to table, was frequently frozen into great lumps, *frusta vini*. Ovid *Epist. ex Ponto*, lib. iv. 7, 9, 10. Virgil *Georgic*, lib. iii. 355. The fact is confirmed by a soldier and a philosopher, who had experienced the intense cold of Thrace. See Xenophon, *Anabasis*, lib. vii. p. 560. Edit. Hutchinson.

and wine is allowed to be the first fermented liquor known to man^b.

It

“Modern ages have not presented an instance of a
“like phenomenon.

“2d. The rein deer, that useful animal, from whom
“the savage of the North derives the best comforts
“of his dreary life, is of a constitution that supports,
“and even requires the most intense cold. He is
“found on the rock of Spitzberg, within ten degrees
“of the Pole. He seems to delight in the snows of
“*Lapland* and *Siberia*; but at present he cannot
“subsist, much less multiply, in any country to the
“South of the Baltic*. In the time of *Cæsar*, the
“rein deer, as well as the elk, and the wild bull,
“was a native of the Hercynian forest, which then
“overshadowed a great part of *Germany* and *Poland*†.
“The modern improvements sufficiently explain the
“causes of the diminution of the cold. These im-
“mense woods have been gradually cleared, which
“intercepted from the earth the rays of the sun‡.
“The morasses have been drained, and, in propor-
“tion as the soil has been cultivated, the air has be-
“come

* *Buffon Histoire Naturelle*, tom. xii. p. 79, 116.

† *Cæsar de Bell. Gallic.* vi. 23. The most inquisitive of the Germans were ignorant of its utmost limits, although some of them had travelled in it more than sixty days journey.

‡ *Cluverius (Germania Antiqua*, lib. iii. chap. 47.) investigates the small and scattered remains of the Hercynian wood.

It has been much disputed of late
whether the various places in the differ-
ent

“ come more temperate. *Canada*, at this day, is
“ an exact picture of ancient Germany; although
“ situated in the same parallel with the finest provinces
“ of France and England, that country experiences
“ the most rigorous cold. The rein deer are very
“ numerous, the ground is covered with deep and
“ lasting snow, and the great river of *St. Laurence* is
“ regularly frozen, in a season, when the waters of
“ the *Seine* and the *Thames* are perfectly free from
“ ice. *†

“ From the most early ages, wine is mentioned by
“ the *Historians* and Poets, and seems to be almost
“ coeval with the first productions from vegetables;
“ The grapes became, at first, a useful part of their
“ aliment, and the recent expressed juices a cooling
“ drink. These, by a spontaneous fermentation,
“ soon acquiring a vinous quality, supplied them
“ with a more grateful liquor, which strengthened
“ and exhilarated their spirits after labour.

“ The *Indians*; in the same manner, discovered similar
“ virtues in the *Palm-trees*; they first made incisions
“ in the bark, with a view of drinking the cooling
“ liquor

* *Charlevoix Histoire du Canada.*

† *History of the Decline and Fall of the Roman Empire*,
by Edward Gibbon, Esq; vol. 1, chap. ix. p. 218.

ent counties in England, which still retain the name of Vineyards, were plantations

“ liquor which distilled from them ; but soon found
“ that, by being kept in vessels, it acquired different and more agreeable qualities.

“ In these times they certainly drank their wine recent
“ and pure, soon after the fermentation had ceased ;
“ but observing, that by acquiring a greater age, it
“ became more generous, they, with art and industry,
“ endeavoured to prepare and preserve it for future
“ use. This, probably, was the first origin and progress of wine : It is mentioned that *Noah* first
“ planted the Vine ; and that wine was offered with
“ bread by the *Patriarch Melchisedech*, amongst his
“ first fruits, as a well-pleasing sacrifice to God.

“ The *Poets*, who were inspired by it, celebrate its
“ praise ; and not satisfied with allowing it to be a
“ most useful human invention, ascribe it to the Gods,
“ to *Osyris*, *Saturn*, and *Bacchus*, and call it their
“ ambrosial nectar.

“ The greatest *Philosophers*, *Legislators*, and *Physicians*,
“ give it due praises, when temperately taken ; and
“ *Plato*, who strictly restrains the use of it, and
“ severely censures the excess, says, that nothing
“ more excellent or valuable than wine was ever
“ granted by God to mankind.”

Barry's Observations, &c. on Wines, p. 27.

tions of Vines for the purpose of making wine.

As

‘The debate arose from a Memoir of the Rev. Samuel Pegge, in the first volume of the *Archæologia*, of the Society of Antiquaries, London, on the introduction, progress, state, and condition of the Vine in Britain. The Honourable Daines Barrington, in his *Observations on the more ancient Statutes*, p. 207, was pleased to combat Mr. Pegge’s notions, and to declare, that he takes the English Vineyards ‘either to have been *orchards*, with Sir Robert Atkins, or rather, according to his own particular sentiments, *currant-gardens*: In short, any thing else but true and proper Vineyards.’ To these remarks of Mr. Barrington, Mr. Pegge replied in a second Memoir, in the third volume of the *Archæologia*, with which Mr. Barrington not being satisfied, he gave in a paper on the subject in the same volume, to consider and answer Mr. Pegge’s observations, and so the matter then rested. Mr. Pegge, however, has since informed me, by Letter, that Dr. Stukeley, in *Itin.* p. 48, speaks of a *Vineyard* near Chipping-Norton, *William Thorne*, col. 2036, of another in *Kent*, and that *Madox*, in his *Hist. of the Exchequer*, i. p. 364, writes, that the Sheriffs of *Northamptonshire* and *Leicestershire* were allowed, in their account, ‘for the livery of the King’s *Vinedresser* at *Rackingham*, and for necessaries for the *Vineyard*.’ He further adds, that the late Dean of *Ely*,

Dr.

As I have not the least pretension to antiquarian knowledge, it will ill become me to endeavour to enter into this debate; and, indeed, it may seem sufficient to observe, that good wines are constantly made in a part of Germany, which is under the same parallel of latitude with many counties in the Southern

Dr. Thomas, imparted to him the following extracts from the Archives of that church:

| | £. | s. | d. |
|--|----|----|-----------------|
| Exitus Vineti | 2 | 15 | 3 $\frac{1}{4}$ |
| Ditto, Vineæ | 10 | 12 | 2 $\frac{1}{2}$ |
| Ten bushels of Grapes from the Vineyard | 0 | 7 | 6 |
| Seven Dolia Multi from the Vineyard, 12 Ed. II. | 15 | 1 | 0 |
| Wine sold for | 1 | 12 | 0 |
| Verjuice | 1 | 7 | 0 |
| One Dolium, and one pipe filled with new wine, and supposed at Ely | | | |
| For wine out of this Vineyard | 1 | 2 | 2 |
| For verjuice from thence | 0 | 16 | 0 |
| No wine, but verjuice made 9 Ed. IV. | | | |

It appears plainly, says Mr. Pegge, from these extracts, first, that in the latitude of *Ely* grapes would sometimes ripen, and the convent made wine of them, and sometimes not, and then they converted them into verjuice, just as it is in Derbyshire,

Southern part of England. And that where the situation and soil are proper for Vines, the lands cannot possibly be more beneficially employed than by being converted into Vineyards.^a

In

Derbyshire, where grapes, growing on the South wall of an house, will, in a hot summer, come to maturity and be very good ; but in a very wet or cold season, will never be fit for the table. Secondly, That these passages, all taken together, it is impossible to understand them of any thing else, than a true or proper Vineyard, as they never can be interpreted either of an *apple-orchard* or a *currant-garden*.

Those who wish to go further into this matter, may consult the Gentleman's Magazine, 1775, p. 513. and 1786, p. 918 ; also Archæologia Soc. Antiq. London, 5. p. 309.

“ I was particularly attentive to enquire of him * what
 “ were the usual produce of a good acre of Vines,
 “ and the account he gave was this : The Vineyard
 “ of twenty-six acres, of which he had the care,
 “ yielded five years ago a produce per acre, of four
 “ pieces,

* *The Vignerons.*

In this pursuit there are four things which ought materially to be considered; viz.

1st.

“pieces, each piece twenty-eight gallons; which sold as follows:

| | | | |
|-------------------------------|-----------|-----------|----------|
| Two pieces at eleven guineas* | 23 | 2 | 0 |
| One piece at 8l. | 8 | 0 | 0 |
| One piece at 4l. 10s. | 4 | 10 | 0 |
| | <u>35</u> | <u>12</u> | <u>0</u> |

The next year's produce was,

| | | | |
|--------------------|-----------|----------|----------|
| Two pieces at 12l. | 24 | 0 | 0 |
| Two pieces at 9l. | 18 | 0 | 0 |
| One piece | 5 | 0 | 0 |
| | <u>47</u> | <u>0</u> | <u>0</u> |

“In general, the produce varies between 30 and 50l.

“In some favourable spots, highly managed, and in

“a good season, a produce of from 60 to 70l. an

“acre has been known.

“As to the expences, they are not so easily calculated;

“for I could not get him to be explicit, nor did I

“clearly understand all his terms.”

Travels through France and Spain in the years 1770 and 1771, by Joseph Marshall, Esq; vol. 4. p. 92.

† This is 8s. a gallon.

1st. The situation—2dly. The soil—3dly. The kinds of Vines which are the most fitting to be planted—and 4thly. The mode of their management.

First. An elevated situation, where there is a gentle declivity to the South or South East, is esteemed preferable to low grounds, which are generally subject to damps and spring frosts, even at times when the adjoining high grounds are entirely free from both.

A Vineyard should be well sheltered to the North, as also to the N. W. and N. E. In an hilly country there are generally many favourable spots, where nature has given important advantages, and these should be still further improved by art.

Plantations of forest-trees, judiciously formed, would contribute much to give warmth and shelter: But these should not be placed too near the Vineyard, so as to confine the air, which would prove very prejudicial.

We

We are informed that, in wine countries, Vineyards are not only confined to gentle declivities, but that they often are formed on slopes on the sides of hills and rocks, which are sometimes so steep as even to border upon precipices: And that Vineyards thus situated, produce grapes uncommonly rich, yielding wines of the most excellent quality.

I am informed too, that the hills in the counties bordering upon the English channel have, in general, declivities tending to the

R 2

South:

"In the neighbourhood of *Piera* there is an eminent hill, the Southern side of which is so steep, that people are obliged to lay hold of ropes fixed to long poles, in order to keep themselves upright, while they stalk from Vine to Vine, to pluck the grapes that cover all that side. Should they trust themselves there without the help of those ropes, the least remissness of attention in stepping might cause a very mischievous tumble. I wonder how people could take it into their heads to plant Vines on so inconvenient a spot: But the trouble of the vintagers is very well repaid by the goodness of those grapes, which yield the most excellent wine that is drank in Catalonia."

Baretti's Travels, vol. 4. p. 72.

South : A circumstance of the greatest importance respecting the plantation of Vineyards.

Secondly. As I have, in the former part of this work, taken notice of the soil proper for Vines, it may seem unnecessary here to enlarge upon that head. I shall, however, just observe, that the Vine delights in such gravelly and rocky soils as we frequently find on the sides of steep hills and rocks, and that

It is a general and received opinion, that this island was originally united with, and formed a part of, the continent.

The similarity of the different strata, which, it is said, form the land on both sides the British channel, serves to confirm us in this belief.

Moreover, on the South coast of England the rocks have a Southern aspect; but on the opposite coast of France, I am told they incline to the North. From thence it is reasonable to conclude, that at the deluge the horizontal stratum (or Isthmus) was broken between these countries, and the bed or middle of the channel falling lowest, the sea naturally flowed into it, and formed what is now called the *British Ghannel*.

that it has sometimes been known to flourish among mere stones and gravel.*

Hence,

“Concerning the soil proper for Vines, I shall give
“the first hint from that ingenious and candid piece
“of Mr. Laurence’s, where, with so much good
“reason, he tells us, that he cannot easily be brought
“to think that any soil or situation can be too dry
“for the roots of the *Vine*, after having seen at
“*Barnwall*, near *Oundle*, in *Northamptonshire*, a
“flourishing *Vine* grow from between the joints of
“an old castle wall, near twenty feet high from the
“ground, which he was told produced admirable
“grapes when it was well managed.

New Improvements of Planting and Gardening,
by Richard Bradley, F. R. S. p. 187.

To the above, the following account from a celebrated Author may be added :

“At *Malaga*, the great mart of wine and fruit, the
“North and East approach is hemmed in by moun-
“tains ; these present, from the town, a most barren
“and unpromising prospect, their tops being im-
“mensely high.—It is in these iron-looking moun-
“tains, and among these peeled (i. e. bald) rocks,
“where there is no appearance of soil or earth, that
“grow annually so many thousand ton of exquisite
“wine, and astonishing quantity of Moscatel raisins.”

Carter’s Journey from Gibraltar to Malaga, II. p. 387.

Hence it will appear, that the introduction of Vineyards into this country would have no bad effect respecting agriculture, because all strong and deep lands, which are best adapted for tillage, are the most unsuitable for Vines.

Permit me to add, that, besides gentle declivities and light soils, such as are proper for Vineyards, Vines grow, in situations and soils, where the lands could hardly be rendered profitable any other way. And thus, though the Vines would not grow robust on steepes of poor gravelly and rocky soils, still they would be more prolific than Vines

^b Although it be not difficult to determine what soil is properly adapted to promote the growth of the Vine from its external appearance, yet there is something in respect of its nature, so deeply hidden from us and unknown, as not to be developed but by the quality of the wine.

I have been informed, that the rich *Hungarian* wine, so universally esteemed for its peculiar flavour, is made only in a very small district near *Tokay*; and that the adjoining Vineyards, where both soil and situation are apparently the same, and although planted with the same kind of grape, produce a wine not only much inferior in its quality and excellence, but also very dissimilar in its colour and appearance.

Vines planted on rich lands, and the fruit would be greatly preferable.

Thirdly. The success of a Vineyard in this country would most essentially depend on the kind of Vines there propagated.

I believe it has been a prevailing, but surely an erroneous, notion, that the sweet early kinds of grapes are the best to plant for the purpose of making wine in this country. And that most or all of the modern trials have been made from Vines brought from *France*.

Among the abundant variety of grapes,¹ I doubt not but there are peculiar sorts, which are by nature singularly adapted to make wines in different climates.

Thus, the sort of grapes propagated in the *Madeira* and *Canary* islands, might not be found,

¹ Mr. Swinburne observes there are forty sorts of grapes in the diocese of *Syracuse*.

Swinburne's Travels in Sicily, II. p. 342.

found, if tried, to make good wines in *France*.

Hence, as the Southern part of this island is almost on the verge of the vinous latitude, it should seem reasonable to suppose, that there would be the greatest probability of success from those kinds of grapes which have been known to thrive and prosper best in the most Northern latitudes. I should therefore recommend the kinds of Vines cultivated in *Germany*, and particularly the sort producing the grapes of which the *Rbenish* wine is made, in preference to any kind cultivated in *France*.

I have remarked above, that the early sweet kinds of grapes are improper for making wine in this country: My reason is, that though such grapes yield a sweet juice, it is not calculated to undergo fermentation.

It is found, by experience, that good-bodied, or generous wines, can be made from grapes of an austere taste, and that too, even before they are quite arrived at a state of maturity: But then wine, from such

such crude grapes, requires to be kept to a good age.^k

The case is similar with respect to apples. It is well known that the sweet kinds of apples, which ripen in the summer months, are very unfit for making of cyder. And that the noblest cyder (such as the *Styre* and

* “ But that we may answer every objection that may be
 “ made against planting *Vineyards* in *England*, give
 “ me leave to recite what I have heard relating to
 “ making of liquors with unripe and sour fruits. In
 “ *Devonshire* a Gentleman made a vessel of *verjuice*,
 “ of *crab*, or wilding-apples, which being placed in
 “ his cellar among other liquors, was not used till
 “ about three or four years afterwards, and was
 “ then found to be so palatable and exceeding plea-
 “ sant, that he now prefers the liquor made of such
 “ wilding sour fruit (after it has had time to digest)
 “ to any *cyder* of that country : So I have known
 “ *verjuice* made of half-ripe grapes, that after two
 “ or three years keeping in a vessel, has become deli-
 “ cate wine ; and the *Rhenish* wines, when they are
 “ newly made, are so sour, that they are not fit to
 “ drink ; but after several years standing, afford us
 “ that incomparable liquor which is called *Old Hock* ;
 “ and, on the contrary, sweeter liquors are apt to
 “ turn sour by keeping.”

New Improvements of Planting and Gardening,
 by Richard Bradley, F. R. S. p. 177.

and *Cockagee*) is made from apples not much better than wildings.

Fourthly. I shall not undertake here to give general directions for the management of a Vineyard; the method of raising Vine-plants, and the common processes of a Vineyard, as practised abroad, having been already delivered to the public by much abler pens. However, I shall beg leave to offer a few ideas on the subject, and particularly on the mode of training the Vines.

As even the most Southern parts of this island are (as I have observed) but nearly on the verge of the vinous latitude, every possible advantage should be consulted respecting the formation and management of a Vineyard here.

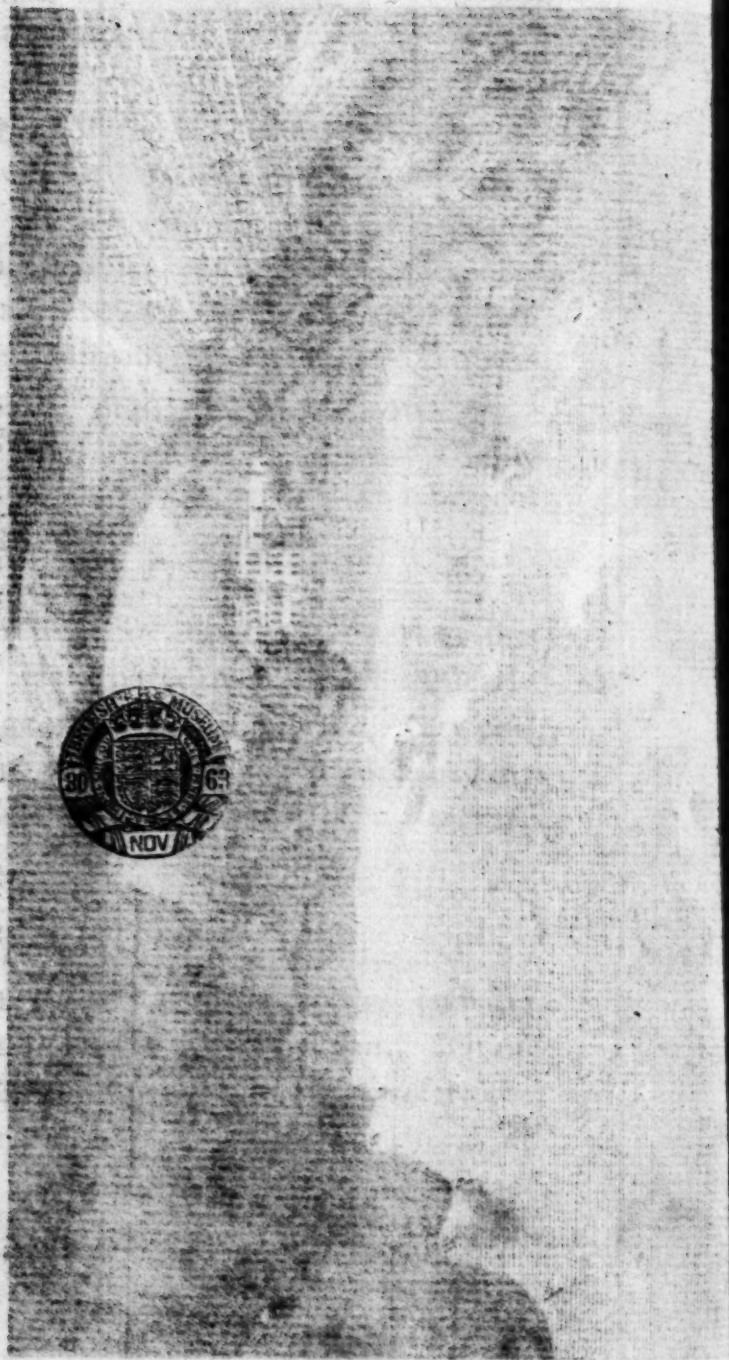
The Vineyards abroad are formed by planting the Vines in rows, by training them in a perpendicular direction. But in this country I should greatly prefer the mode of training the Vines in a lateral or horizontal form, similar to the method practised in *Holland*, with Vines in frames, as I have



Height from a to b 8 Feet. Breadth from b to a 6 Feet.

SECTION AND VIEW OF A HILL FOR THE GROWTH OF VINES.

SECTION VIAD / 1894. THE / 11TH BATT. ALIN (PROV. CH. OR. / 12345.



I have already hinted, p. 133. and p. 172. There would be little difficulty in this method, as the Vines would readily be trained along small poles, not thicker than those used for hops. These should be fixed nearly parallel to the ground. Vines thus trained would derive, I apprehend, many advantages, not only by means of warmth and shelter, but that they would most easily also be protected from spring frosts, by applying the boughs of trees, particularly evergreens. The grapes also, let me observe, would be greatly benefited by the reflection of the soil underneath.

When Vines are intended to be planted on the steeps of hills, and on the sides of rocks, the ground should be prepared and formed in the manner of steps, as in plate v.

The Vines should be planted near the angle a , and trained by stakes upwards, from a towards b .

It will be absolutely necessary that the ground should be lower at the angular point a , of every step, than at b ; for
without

without this care, the Vine-plants would lose the advantage of such rains as fall hastily and perpendicularly.

It is easy to conceive what advantage Vines would gain from a situation thus planned, since the back from *a* to *b* would be nearly equal to a wall.

The expence attending the formation of the ground cannot be very considerable. The work should be begun at the top, and the soil taken out should be thrown down the hill,

I should have observed, that it would be further beneficial to have a little good soil put in at the angles before the Vines are planted : And also, that all hills of a Southern aspect, and composed of either slate, gravel, scaly rock, or limestone, are very proper to be planted with Vines.

In a dissertation on the growth of wine in England, by F. X. VISPRE, printed at Bath 1786, the ingenious author informs the public, " That in September 1782, he hired a piece of ground at *Wimbledon* ; that
in

in March 1783, he planted it with Vines ; that his intention was then to train the shoots of them (as he has since done at *Chelfea*) upon the ground in their natural positions, like the Vines of melons and cucumbers ; and that he hopes to make good wine with well-ripened grapes, almost every year."

Mr. *Vispré* does not arrogantly assume the invention of this method to himself, but very candidly acknowledges, that he pursued and practised it in consequence of the following hint from that great and sagacious philosopher Lord Chancellor BACON, who says, " The lowness of the fruit-boughs makes the fruit greater, and causes it to ripen better ; for we always see in apricots, peaches, and mello-cottens upon a wall, the largest fruit is towards the bottom ; and in France, the grapes that make the wine, grow upon low Vines bound to small stakes, while the raised Vines in arbours make verjuice."

He adds, " It is reported, that in some places Vines are suffered to grow like herbs, spreading upon the ground, and the
grapes

grapes of these Vines are very large; it were proper to try whether plants usually sustained by props, will not bear large leaves and fruit, if laid along the ground, as hops, ivy, woodbine, &c."

This last citation, says Mr. Vispré, from the works of the Chancellor, shews very clearly that the Rev. Mr. LE BROcq is under a mistake; when, in his description of the methods of planting and training all kinds of fruit-trees, Vines, &c. (for which his Majesty's Letters Patent have been granted to him) he says, p. 4. "I sincerely request they will accompany me in my illustration of my new methods of horticulture and fructification."

This method, according to the description, is, to train all sorts of fruit-trees or Vines upon or near the ground. Says Mr. Vispré, "I do not know whether the above method, suggested by Lord Chancellor BACON, was tried by any person before myself; but I believe Mr. LE BROcq less intitled to call it his, than I am to call it mine, since I have practised it with success

" success these two last summers, I never
 " dreamt of monopolizing that method ;
 " I was sufficiently satisfied with the prospect
 " of being the restorer of Vineyards in this
 " country : But that I might not lose the
 " honour of being deemed such, in May
 " 1784, I presented to the society for the
 " encouragement of arts, &c. a plan, adapt-
 " ed to this climate, for cultivating Vine-
 " yards ; and afterwards left open my
 " Vineyard to the inspection of the cu-
 " rious.

" The laying the plants in the ground
 " every year, and training the shoots upon
 " it, was in that plan the first article. At
 " the end of the year I gave an account
 " of the first experiment to Mr. More, se-
 " cretary to the society.

" I have done the same lately of the
 " second year. This last season having
 " proved more favourable than the preceding

" one,

" Fruit-trees of various sorts have been trained in the
 above described horizontal form in the gardens at Welbeck
 more than fourteen years.

“one, and the shoots of the Vines having
 “been laid for the second time, the grapes
 “were considerably larger than those of the
 “same kind growing on a South wall, and
 “ripened as I said before.”

Mr. *Vispré* produces many instances of
 wine being made in various parts of
 England; some of which I shall here beg
 leave to transcribe.

“Mr. BRADLEY, professor of Botany in
 “Cambridge, in his *Dictionary Botanicum*
 “Art. *Vitis*, says, “I cannot help mentioning
 “how our poor soils might be improved by
 “making of Vineyards, a good instance of
 “which is at Mr. JOHN WARNER’S, a gen-
 “tleman of Rotherhithe, near Southwark,
 “who makes good wine from his own
 “Vineyards.”

“STEPHEN SWITZER, in vol. ii. p. 266,
 “of his *Ichnographia Rustica*, published in
 “1742, says, That Vineyards may be so
 “cultivated in England, as to produce large
 “quantities of grapes, and those so well
 “ripened, as to afford a good and substan-
 “tial

“ tial vinous juice, needs no demonstration ;
“ when in several parts of *Somersetshire* there
“ are, at this time, flourishing Vineyards,
“ and the Vineyard of the late Sir WILLIAM
“ BASSET, in that county, has annually
“ produced some hogheads of good-bodied
“ and palatable wine, which I have been cre-
“ dibly informed by gentlemen who have
“ drank considerable quantities of it with
“ the greatest satisfaction.”

“ BARTHOLOMEW ROCQUE, a gardener
“ at Walham Green, made wine for thirty
“ years from a Vineyard he had planted in
“ a common field garden ; and although
“ the ground was flat, the wine was as
“ good as that of *Orleans* or *Auxerre*, in
“ the judgment of some acquaintance of
“ mine still alive.”

Dr. HALES, in vol. iv. of his *Complete
Treatise on Practical Husbandry*, written
equally for the service of the farmer and
country gentleman, says, p. 2. “ This we
“ can say with certainty, that very good
“ wine may be made in England, and that
“ in many parts of the kingdom there
S “ are

“are pieces of land which may be turned
“to some account this way, at a small ex-
“pence ; and others which will answer to a
“more chargeable preparation, in such a
“manner as to make the farmer very
“happy.”

“And again, he says in p. 11, I have
“drank with the distinguished and eminent
“Dr. SHAW, wines made under his own
“care, from a little Vineyard behind his
“garden at Kensington, which equalled
“many of the lighter wines of France ;
“and while due care was taken of the
“Vineyard at Hammer Smith, a great deal
“of very good wine was obtained there
“for sale, yet neither of these were favour-
“able spots.”

“The BATH Vineyards might serve as
“a better example for the husbandman,
“who should consider only profit from
“them ; the juice of the grapes was sold
“there as it was pressed from the fruit,
“and the owners had no further care than
“managing the ground and gathering.

“In one of these instances there was
“excellent wine made for the table; in
“the other, a profitable kind for sale;
“and in the third, no more trouble was
“allowed to this than the farmer usually
“afforded to his flighter products; yet
“they all answered when well conducted.
“The two last might have been better
“managed, and their profit rendered three-
“fold. *We speak of what we know with*
“*certainty, having seen and examined them*
“*all.*”

“I have known,” says Mr. Hanbury,
“good wine made of grapes growing in
“England, and have drank our *Burgundy*
“no way inferior, as my taste could find
“out, to that noted wine which we have
“constantly imported from that country.
“Doubtless, therefore, there are some soils
“and situations that will suit Vines, and
“cause their fruit to ripen properly here.
“When a person is possessed of such
“a spot, then he may proceed to plant
“it a Vineyard, otherwise he will find his
“labour and expence thrown away.”

Complete Body of Gardening,

vol. ii. page 783.

S 2

As

As modern instances impress the mind more forcibly than such as are more ancient, I have reserved the account of the success of the Vineyard at *Pain's-Hill*, for my last and most convincing illustration. It is thus elegantly introduced by Sir *Edward Barry*, in his celebrated Treatise on wines, p. 468.

“From the history of ancient and modern
“wines, we may be capable of forming
“a more true judgment of the various
“nature and qualities of wines, which,
“in the general, are chiefly owing to the
“climate and soil. It is very remarkable
“that the grapes of all Vines, planted
“within the *fifty-first degree* of the Northern
“latitude, acquire such a degree of strength,
“as renders them fit for producing good
“wine, in which the *terrene* and *saline*
“principles prevail, though they are more
“refined and corrected as they advance to
“maturity; but as the climate advances
“more to the South, they acquire more
“strength, and the *oleaginous* and *spirituous*
“principles prevail, and in any consider-
“able quantity cannot be salutary without
“being

“being diluted with water ; on which ac-
“count the wines produced in temperately
“warm climates, where the principles are
“more *equally blended and united*, are more
“light, and though generous, more salu-
“tary, and agreeably adapted to promote
“social happiness, than those produced in
“either *extreme* : Such are particularly the
“*French, Hungarian, Italian, and some of*
“the *Spanish and German* wines.

“It is a just observation, that one half
“of *Germany*, which is to the North of the
“*vinous latitude*, is entirely destitute of
“any good wine, while the other half
“abounds with fertile Vineyards, and a
“variety of good wines ; and likewise
“shews, that a very moderate addition
“to the warmth of the climate, is sufficient
“to produce excellent wines ; in which the
“*soil* principally, with other circumstances,
“has at least an equal influence with the
“warmth of the climate, and in some in-
“stances a greater, in giving the peculiar,
“grateful qualities, for which some wines
“are distinguished. Of this several instances
“are known, where not only the same cli-
“mate,

“mate, but in places very near adjacent,
“from the same Vines, and in the same si-
“tuation, and aspect to the sun, very dif-
“ferent wines are produced, which can be
“only owing to the *soil*.

“From hence it is evident, that good
“wines may be made in several parts
“of *England*, which are within this vinous
“latitude.

“The ingenious Mr. Miller shews, from
“ancient records, that in many parts of
“*England*, and particularly near *abbeys* and
“*monasteries*, good wines were made, and
“that these places are still distinguished
“with the name of Vineyards; but how
“they were rooted up and neglected, there
“are no clear accounts left. He like-
“wise observes, that an obstinate prejudice
“has prevailed against making any farther
“trials from some improper ones made near
“*London*, where the *soil* is not *friendly* to
“the *Vines*, and where the wines were so
“injudiciously made, that under the same
“disadvantages neither those of *Italy* or
“*France* would have succeeded. He there-
“fore,

“fore, with his usual modesty and candour,
“gives his opinion, founded on some trials,
“which he had seen made, and the instructi-
“ons he had received from several persons
“abroad, who cultivated Vineyards for
“their own use, and that of their friends,
“and who have been very exact in ob-
“serving the several methods of practice
“among the Vignerons of those countries ;
“from whence he hopes, that the prejudice
“which still prevails against any project of
“this kind might be removed, or at least
“suspended, until farther trials shall have
“been more judiciously made, which he
“thence proceeds to direct. But had he
“been acquainted with the success which
“attended the Vineyards of my ingenious
“friend, the Honourable *Charles Hamilton*,
“who has been long distinguished for his
“peculiar elegant taste, he would have
“spoken with more certainty. To him I
“am particularly obliged for the following
“exact description which he has, at my
“request, given of the rules he had pur-
“sued, and which he has given me leave to
“publish.”

The

The Vineyard at Pain's-Hill is situated on the South side of a gentle hill, the soil a gravelly sand; it is planted entirely with two sorts of Burgundy grapes, the Auvernat, which is the most delicate, but the tenderest; and the Miller grape, commonly called the Black Cluster, which is more hardy. The first year I attempted to make red wine in the usual way, by treading the grapes, then letting them ferment in a vat, till all the husks and impurities formed a thick crust at the top, the boiling ceased, and the clear wine was drawn off from the bottom.

This essay did not answer; the wine was so very harsh and austere, that I despaired of ever making red wine fit to drink; but through that harshness I perceived a flavour something like that of some small French white wines, which made me hope I should succeed better with white wine. That experiment succeeded far beyond my most sanguine expectations; for the very first year I made white wine, it nearly resembled the flavour of Champaign; and in two or three years more, as the Vines grew stronger, to my great amazement my wine had a finer flavour than the best Champaign

paign I ever tasted. The first running was as clear as spirits; the second running was *ceil de Perdrix*, and both of them sparkled and creamed in the glass like Champaign. It would be endless to mention how many good judges of wine were deceived by my wine, and thought it superior to any Champaign they ever drank; but such is the prejudice of most people against any thing of English growth, I generally found it most prudent not to declare where it grew, till after they had passed their verdict upon it. The surest proof I can give of its excellence is, that I have sold it to wine-merchants for fifty guineas a hoghead; and one wine-merchant, to whom I sold five hundred pounds worth at one time, assured me, he sold some of the best of it from 7s. 6d. to 10s. 6d. per bottle.

After many years experience, the best method I found of making and managing it was this: I let the grapes hang till they had got all the maturity the season would give them; then they were carefully cut off with scissers, and brought home to the wine-barn, in small quantities, to prevent their heating, or pressing one another; then they were all picked off the stalks,

stalks, and all the mouldy, or green ones, were discarded, before they were put upon the press; where they were all pressed in a few hours after they were gathered, much would run from them, before the press squeezed their own weight one upon another. This running was as clear as water, and sweet as syrup, and all this of the first pressing, and part of the second continued white; the other pressings grew reddish, and were not mixed with the best. As fast as the wine ran from the press into a large receiver, it was put into the hogsheds, and closely bunged up. In a few hours one would hear the fermentation begin, which would soon burst the casks, if not guarded against, by hooping them strongly with iron, and securing them in strong wooden frames, and the heads with wedges. In the height of fermentation, I have frequently seen the wine ouzing through the pores of the staves.

These hogsheds were left all the depth of winter in the cool barn, to reap the benefit of the frosts, when the fermentation was over, which was easily discovered by the cessation of noise and ouzing; but to be more certain, by
pegging

pegging the cask, when it would be quite clear, then it was racked off into clean hogsheds, and carried into the vaults, before any warmth of weather could raise a second fermentation. In March, the hogsheds were examined; if any were not quite fine, they were fined down with common fish glue, in the usual manner; those that were fine of themselves were not fined down, and all were bottled about the end of March; and in about six weeks more would be in perfect order for drinking, and would be in their prime for above one year; but the second year the flavour and sweetness would abate, and would gradually decline, till at last it lost all flavour and sweetness; and some that I kept sixteen years became so like Old Hock, that it might pass for such to one who was not a perfect connoisseur.

The only art I ever used to it, was putting three pounds of white sugar candy to some of the hogsheds, when the wine was first tunned from the press, in order to conform to a rage that prevailed, to drink none but very sweet Champaign.

I am

I am convinced much good wine might be made in many parts of the South of England. Many parts are South of Pain's-Hill; many soils may be yet fitter for it, and many situations must be so for mine was much exposed to the South-West wind, (the worst of all for Vines) and the declivity was rather too steep; yet with these disadvantages it succeeded many years. Indeed, the uncertainty of our climate is against it, and many fine crops have been spoiled by May frosts and wet summers; but one good year balances many disappointments.

“ There are not wanting in this coun-
 “ try several gentlemen of fortune, who
 “ make the improvements in agriculture
 “ their favourite study and practice. To
 “ such, no experiments could give a more
 “ rational and elegant amusement than
 “ planting and cultivating a small Vineyard
 “ in a favourable situation: Nor could the
 “ fruits of any other plantation afford that
 “ cheerful pleasure, which they would re-
 “ ceive, from drinking fine wines of their
 “ own production. The prospect of some
 “ success, even from the first trial, seems
 “ almost

“ almost certain, if conducted by the rules
“ given by Mr. *Hamilton* and Miller, with
“ the necessary assistance of a good Vig-
“ neron, well versed in the mechanic
“ operations of this process. Neither
“ is it improbable, but that in some time
“ several Vineyards may be propagated, on
“ account of the profit arising from them,
“ and this country supplied with native
“ wines, very superior to many of those
“ which are now imported.”

From the foregoing accounts, it is evident that good wines may be made in this country in a propitious season : And it is also certain, that formerly there have been Vineyards in many parts of this kingdom, particularly near Abbeys and Monasteries. This plainly appears by the lands in various places still retaining the name of Vineyards : But Antiquaries are silent as to the reasons of their being rooted up and neglected.

F I N I S.

which are now imported from France, Italy, Spain, and the country supplied with wine, the account of the profit arising from them, several vineyards may be propagated, or it is improbable, but even in four or five years, the operations of this process, which are now well valued in the neighborhood of a good vineyard, will be given by Mr. W. W. Miller, who is almost certain, if conducted by the rules.

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| —— Plato's most exalted praise of - | 253 |
| —— the invention of, ascribed to the Gods, and called their ambrosial nectar - - | ib. |
| —— of a good body can be made from grapes of an austere taste, even before they are ma- ture - - | 264 |
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| Young Vine-plants, when raised from seed, require particular attention during their infant state | 63 |
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EXPLANATION to Plate I. p. 124.

- a a* Pits for fruiting Pine-plants.
b b Pits for succession, or young Pine-plants.
c c Front wall.
d Fire-place partly in the front wall, which is worked only in very cold weather.
e e e Flue.
f Cistern which receives the water that falls on the roof of the Hot-house.
g g g g g g Walks in the stove.
h h Small porches which close with double doors at the entrance of the stove.
i i Fire-places in the middle of the back wall, which communicate with the flues *k k*.
l l Fire-places at the ends of the back wall, which communicate with the flues *m m*.—N. B. The flues *m m* make one return, as represented in the section.
n n n Close fire-houses.
o o Open sheds.
p Pipe that conveys the water to the cistern.
q Level of the border in front of the stove.
r Foundation of the front wall.
s Apertures, or holes through which vines are conveyed.
t Stone in front, with a groove to receive the water that falls from the roof.
u v w Top, middle, and lower lights.



EXPLANATION and OBSERVATIONS
to Plate II. p. 131.

a Fire-house.

b b Fire-places, which communicate with the flues *c c*.

c c First flues.

d d Second flues.

e e Third flues.

f f Fourth flues.

* * * One fire ought not to be allowed to work more than about thirty feet in length, because by the time it has made four returns, (viz. 120 feet) its heat is generally nearly spent. As the heat decreases proportionably to the distance from the fire-place, the diminishing of the dimensions of the flues is obvious. On this account, some Persons who give designs for building of Hot-walls, recommend a brick on edge instead of a brick in breadth, for the front of the two uppermost flues. When this expedient is intended, it will be proper to have narrow bricks, of the thickness of common bricks, made on purpose to suit the work.—But when the wall is intended to be drawn with stucco, this last precaution will be unnecessary.

EXPLANATION AND OBSERVATIONS

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- 2 The House.
- 3 & 4 The places, which communicate with the House &c.
- 5 The House.
- 6 The House.
- 7 The House.
- 8 The House.

* One has ought not to be allowed to work more than about thirty feet in length, because by the time it has made four turns, (viz. 100 feet) the bent is generally nearly equal. As the bent decreases proportionally to the distance from the first place, the diminishing of the distance of the bent is obvious. On this account, I am informed who give designs for building of 1100 walls, recommend a brick on edge instead of a brick in breadth for the front of the wall, & the wall itself bent. When this expedient is intended, the bricks are made on purpose to fit the work—but it is intended to be drawn with flutes, this will be necessary.



